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RESTORATION OF THE STEAM SCHOONER WAPAMA

Report #1 to the State of California
Division of Beaches and Parks,
on the History and Restoration of the

WAPAMA

by the
San Francisco Maritime Museum

San Francisco

January, 1960

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FOREWORD

At this writing, the restoration work carried out aboard the steam schooner WAPAMA has proceeded through an initial phase of demolition of unsound structures, followed by an effort in the late fall and early winter to accomplish basic reconstruction work necessary to making upper structures relatively water-tight, in order to prevent further rapid deterioration of the vessel during the rainy season. The limited restoration funds available made it expedient to carry the C. A. THAYER well toward display condition and to hold work on the WAPAMA to what was obviously necessary in order to prevent commitment to work which might, with funds dwindling, go uncompleted or be completed in an inferior manner, inconsistent with the dictates of long-term economy.

By now, however, the extent of restoration work which may be attempted is comparatively apparent. This first Report in the series on the history and restoration of the WAPAMA is devoted entirely to the restoration effort which will be conducted during the following year. It considers the nature and extent of the work which can be undertaken and the rationale of the proposed program.

Subsequent reports and memoranda will deal with various aspects of the WAPAMA's restoration and interpretation in such detail as is appropriate to the subject and to such extent as is required by the restoration personnel.

The history and significance of the West Coast steam schooner in general, and of the WAPAMA in particular, will be developed at length in future formal reports.

WAPAMA AT OAKLAND

May 22, 1959

Commencement of the Second Phase in the Restoration . . .

Work done in Seattle the previous year placed the WAPAMA in condition to tow down the coast. In May of 1959 the effort to place the vessel in display condition began at the Oakland Dock & Warehouse Company.

The men on deck are engaged in the laborious task of removing the thick black-top that had been laid over the main deck. Within a month of the date of this photograph, reconstruction was well underway.

I

RESTORATION AND INTERPRETATION
OF THE STEAM SCHOONER
WAPAMA

Introduction

Problem of Restoration

Condition of the Vessel

Restoration Policy

Forecastle-Head

Forecastle

Waist

Under the Poop

Poop Deck

Boat Deck

Engine Room

INTRODUCTION

The "steam schooner," of which the WAPAMA represents a prime example, was a type of vessel developed on the West Coast in the 1880's to meet the necessities of the lumber trade between San Francisco and ports to the north. The type, once established, developed rapidly, and by 1900 had assumed its characteristic form. Well over 200 of these modest coastwise carriers were built between 1884 and 1923, and they remained a prominent feature of the San Francisco Bay scene through the 1930's, long after they had ceased to play a vital role in the export of redwood and Douglass fir lumber from the Mendocino Coast and the Pacific Northwest.

The difficult loading conditions found along the coast in the redwood country of California seem to have been the essential motive for the early development of the type. The "dogholes" where the little two-masted schooners loaded redwood along the rugged coastline were as exposed and dangerous as the name implies; vessels were generally moored directly beneath a bluff, and the lumber was sent down onto the pitching decks of the schooner by means of a chute.

The advantages of steam over sail in operating into and out of these rocky, storm-swept chinks in the coastline must have appeared attractive at an early date, although the cheapness of lumber as a cargo did nothing to encourage the construction of expensive vessels for its transport.

Although it would appear logical that the first steam schooners would have been no more than sailing vessels with auxilliary engines installed, photographs of the earliest steam schooners would indicate that they were launched as steam vessels, although they carried a large rig and were generally similar in form to the sailing schooners which they were destined to replace. The SURPRISE, launched at the North Beach shipyard of C. G. White in 1884, which may have as good claim to the title of "first steam schooner" as any other vessel, appears in her launching photograph with a three-masted rig, complete with bowsprit, but with engine and deckhouse in place and with the semi-cylindrical stern characteristic of much later steam schooners.

This is not the place to consider in detail the design and intended use of the first few steam schooners: it is clear that by 1886 the steam schooner was an established type, built primarily for the coastwise lumber trade. In 1887 twelve steam schooners were built, eleven of them in San Francisco, and the following year seventeen new steam schooners joined the growing fleet, fourteen of them from San Francisco yards.

Steam schooner construction continued at a slower pace through the 1890's, but a new spurt came in 1898, at least partially as a result of the boom in coastwise shipping caused by the Klondike gold rush. The building boom continued through 1908, and during this period the steam schooner achieved its final and characteristic form. The rapid development of the type was necessitated by the tremendous expansion of the lumber industry (resulting in large part from the Southern California building boom, and from the demand for materials to reconstruct San Francisco after the earthquake and fire) and was facilitated by the change to corporate ownership of steam schooners, financed through charter-

agreements with mill owners.

Steam schooners switched to oil fuel, expanded passenger accommodations, and grew to the size of the WAPAMA, carrying 1,000,000 feet of lumber and thirty or more passengers. The steamers rapidly replaced sailing schooners, and because of their much higher speed and rapid turnaround time they carried a more disproportionate share of the lumber trade than their numbers alone would indicate.

A last burst of steam schooner-building came with the World War I shipping shortage and continued into 1920. The last steam schooner built was launched by the Matthews yard in 1923. The depression and subsequent waterfront strife on the West Coast hit the steam schooner owners as hard as other ship owners, while at the same time larger steel ships were built or acquired for the trade as old wooden steam schooners deteriorated or succumbed to the perils of the coastwise navigation.

Hard times in the '30s and the Second World War scattered the remainder of the fleet until only the TONGASS (ex-WAPAMA) remained operating in American waters by 1948.

During their heyday, the steam schooners served as the most vital link -- in some cases the only important link -- between lumber towns from Gualala to Puget Sound, and the market for their product and the source of their supplies. As was the case in many other parts of the United States during the last half of the nineteenth century, specialized needs produced a specialized type of vessel to meet local conditions. The steam schooner was one of the most interesting and unusual of these types.

The WAPAMA, as the last of her breed, naturally serves as representative for the first of the steam schooners as well -- though possibly the C. A. THAYER has more in common with the little steamers of the

'80s and early '90s than does the WAPAMA. She speaks, most specifically, for an awkward, half-modern span of time quite different from that invoked by the BALCLUTHA or C. A. THAYER.

"WAPAMA, 951 tons, with 1050-M feet lumber capacity, was built by the St. Helens Shipbuilding Company at St. Helens, Oregon, for the C. R. McCormick interests. She was fitted at Oakland by Moore & Scott with a triple expansion engine of 825 h. p."

She represents an era in which the family machine was not yet ready to take her passengers half the length of the Pacific Coast for the jazz age -- the 1920's -- almost as graceless as what went before (but even now, in 1959, attaching to itself a certain glamor -- the last wild fling of a departed order) . . . illicit liquor a preoccupation, a reality the closer one gets to the sea and ships . . . then, hard times, hard on ships . . . the great maritime strikes from which the coastwise trade never recovered . . . a fog-shrouded career in World War II out of necessity (and out of character, too) to Alaska.

In time the WAPAMA will be the only wooden ship left that so well sums up these times.

THE PROBLEM OF RESTORATION

The salient fact in the restoration of the WAPAMA is that there is not enough money available to do an entirely complete job, either from the viewpoint of a naval architect or from the standpoint of a public display. The process of tearing out and rebuilding must be stopped somewhere, and the decision as to what must be done -- and what must be left "as is," or in a partial state of restoration -- must be based upon a simultaneous appreciation of both the problem of preservation of the ship and of the manner in which it can be most effectively displayed to the public.

Limited funds make it imperative that expenditures which will not "show up," which will not add to the display value of the ship, be scrutinized most carefully. At the same time great care must be exercised in avoiding a "penny wise" policy which offers maximum initial display value at the risk of uncomfortably rapid deterioration of the essential structure of the ship, or which commits the State of California to early restoration of portions of the ship which are "restored" in the current project.

On the other hand, it is anticipated that there will be both the time and money to present the WAPAMA to the public by the end of 1960 (or before, if necessary) as a first-class (if not complete) display, -- acceptable not only to the general public, but even to the knowledgeable criticism of the maritime historian. Further, the contemplated restoration program is designed to result in not only a sound display, but in as sound a ship as possible, and short-run goals are not to be achieved at the expense of long-term economy.

GENERAL CONDITION OF THE VESSEL

The WAPAMA is a large and old wooden ship, which has spent her last ten years laid up in fresh water in one of the rainier portions of the world. Under such conditions, it is hardly surprising that rot has spread rather extensively through her structure. Generally, her hull, her basic structure, is sound, but as one proceeds upwards, through those areas more subject to leaks, deterioration becomes more and more evident.

The forecastle decking, and some of the beams beneath it, are in poor condition, and the poop repeats this story, though not to such an extensive degree, as the poop is partly sheltered by the boat deck. The boat deck was in a deplorable state, and during the course of the restoration program must be almost entirely replaced. Upwards and downwards from the boat deck itself, rot has spread into coamings, beams, studs, and the exterior and interior sheathing of the superstructure to such an extent that the repair of the superstructure could represent the largest single item in the restoration of the vessel.

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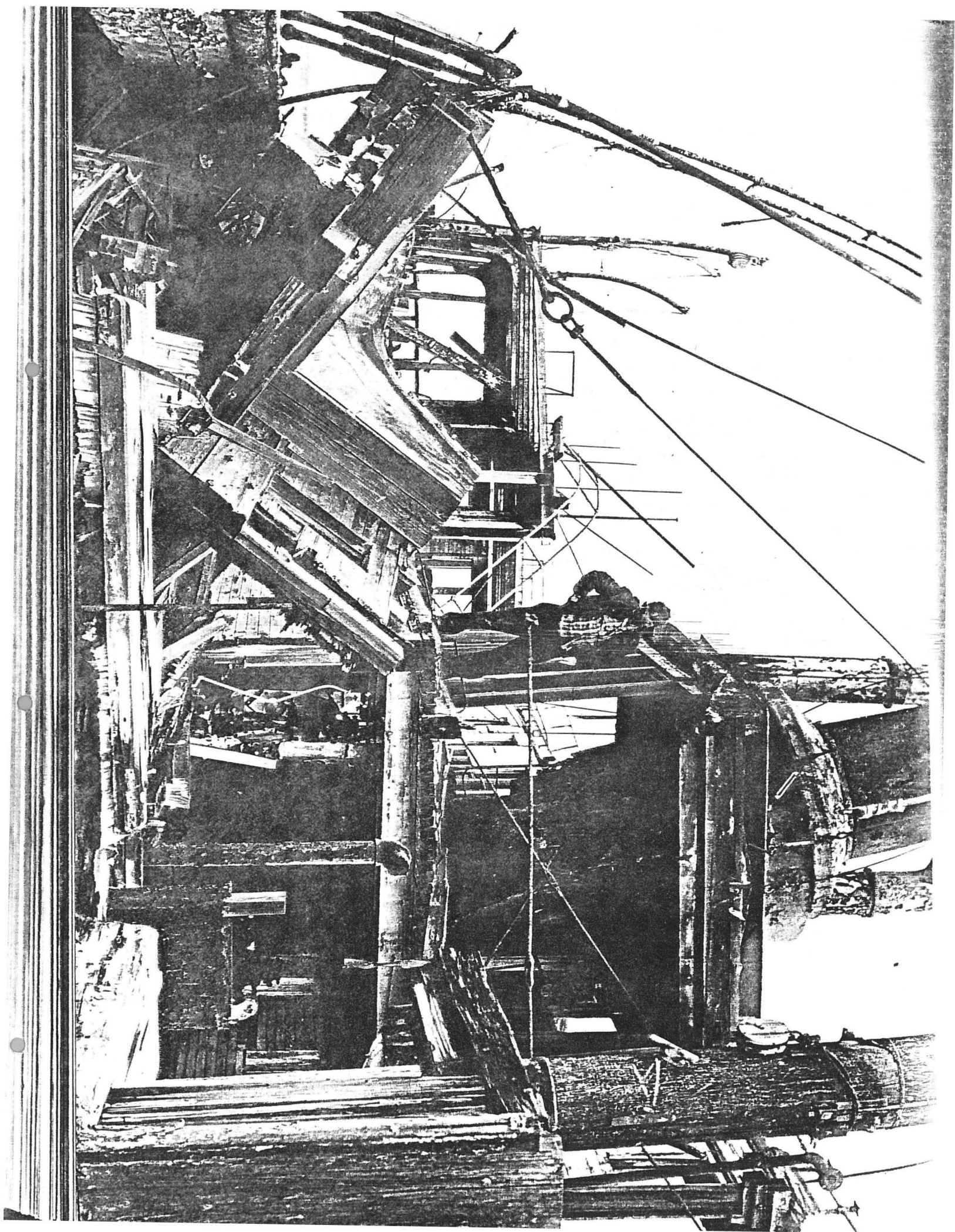
STEAM SCHOONER CONSTRUCTION

Massive Timbers Characterized West Coast Steam Schooner Construction

San Francisco Maritime Museum Director Karl Kortum examines the wreckage of the WAPAMA's sister-ship CELILO with an eye to acquiring useful materials, such as the large natural-crook knee in the foreground.

Such knees are now almost unattainable, and large, clear timbers are difficult to find. Ship-quality lumber, common and cheap in 1915, is now scarce and expensive.

The CELILO, lying on a deserted island in Suisun Bay, was burned by vandals on the eve of a joint Beaches & Parks-Maritime Museum expedition to salvage materials. However, it subsequently proved possible to recover some valuable engine-brasses from the hulk.



RESTORATION POLICY

The purpose of restoring the WAPAMA as a public display is not of necessity consistent with preserving the vessel from further deterioration: for example, renewal of the forecastle decking adds nothing to the historic or display value of the ship, while restoration of the main engine will not add one day to her life. Following would seem the proper priority of work:

1. It is essential, in order to prevent rapid future deterioration, that the vessel's decks, from the boat deck down, be made watertight, even when this involves renewal. In such cases as the structure under a deck to be renewed is in poor condition, it must also be renewed to whatever extent is necessary to preserve the essential integrity of the structure -- bearing in mind that the ship is not going to put to sea again.
2. The restoration of those parts of the WAPAMA which most clearly characterize the vessel is of next priority.

The WAPAMA was a lumber carrier, and her hold and cargo-handling gear are one of her most obvious and important attributes. The new masts and booms are already on hand; the old iron-work and some of the old rigging can be utilized in replacing the rig.

The WAPAMA is a steamship, and her engine-room is as important from the standpoint of interpreting the vessel as are the C. A. THAYER's masts and booms. The engine room is clearly one of the essential -- probably the most essential -- display areas aboard the ship. The engine room is at present in chaotic condition, and to the costs of restoring it must be added the expense of providing adequate means for the public to view an area designed for the convenience of a "black gang" wearing overalls.

The WAPAMA was a passenger-ship, and the most striking characteristic of her accommodations, the paneled lounge, stair-case, and dining saloon, distinguish her completely from the functional "freighter" such as the THAYER or BALCLUTHA. Alterations, vandalism, and deterioration of the paneling add up to a costly restoration job in this essential display area.

3. The ship must be made as presentable and realistic as possible in external appearance, and adequate provision made for the interpretation of the vessel to the visitor.

4. Further repair or renewal should be contemplated only after the cost of the above items has been finally established.

FORECASTLE-HEAD

An "Observation Post" . .

The attitude of the WAPAMA in her light condition -- the stern well-immersed under the weight of engine and boilers, the bow floating bouyant and high -- determines the character of the forecastle-head to a great extent. Height above the water (some 30 feet below the stem-head) and height above the main deck give the sightseer a windswept observation platform at the outer end of the project.

Forward stretches a vista encompassing the Golden Gate and Alcatraz, aft the well-deck of the WAPAMA and her pilot house and beyond all of Aquatic Park.

The great height of the WAPAMA's forecastle distinguishes her completely from the other ships in the project: there is no such "perch" as this aboard the THAYER or EUREKA -- nor even on the BALCLUTHA. Only the top of the WAPAMA's house will provide a somewhat similar feel.

This high "fore castle" has somewhat the quality of the fifteenth or sixteenth century ship, not only because of its great height but as a result of the striking break in the sheer at the after end of the structure. The large knees at either end of the heavy beam at the break of the forecastle repeat a theme typical of antique wooden ship construction -- this same feature appears in the reconstruction of the SANTA MARIA at Barcelona.

Cargo Gear

On the other hand an air of modernity and efficiency is imparted to the forecastle-head by the pair of steam winches and the complicated steam windlass with its heavy chain leading forward to stockless anchors.

The foremast passes right through the after end of the forecastle deck; between the winches, the goosenecks of the cargo booms are fastened to the mast above the visitor's head; the wire-rope whips leading from the winch-drums near his feet up to the sheaves at the outer ends of the topped-up booms and down to the deck near the main hatch should establish immediately the connection between this machinery and its function.

The operation of cargo-handling is most clearly displayed here on the forecastle, where there is less clutter than on the after winch-platform. Too, the appearance of the ship will probably be best with the forward booms topped in their working position and the after booms resting on deck in their sea-going attitude -- four splayed-out booms, with the attendant confusion of rigging, will make the point no clearer and will not enhance the general appearance of the ship.

Policy of Interpretation

The operation of the cargo-handling gear will not be at all self-evident to the general public, and the need for adequate explanation clearly calls for the employment of some type of display panel which can carry text and pictures, and which is in keeping with the character of the ship. In part, the need for explanatory material can be filled by a brochure, but the guide-book should not be relied upon as a total substitute for the display panel, for both techniques have their virtues and their place.

Obviously, display-panels cannot be scattered too profusely without detracting from the appearance of the ship; they are limited in the amount of text which they can carry; they are expensive; and, finally, the visitor cannot take them home. On the other hand, a pamphlet can become too cluttered to serve its purpose as a guide-book adequately; it is physically divorced from the object or activity it explains, and lacks the impact which both proximity and size give to a panel; and printed matter is inflexible in direct ratio to its quality and attractiveness, since it is very costly to amend.

An integrated, coherent, and imaginative use of many of the available techniques of interpretation will be needed to extract the maximum display value from both ships. The problem of showing the public how the WAPAMA's cargo-handling gear operated illustrates this point very well. We will discuss specific display problems and techniques in future reports, but the general problem must be kept in mind during all stages of the restoration, as the physical appearance of the vessel itself is the first step in its interpretation.

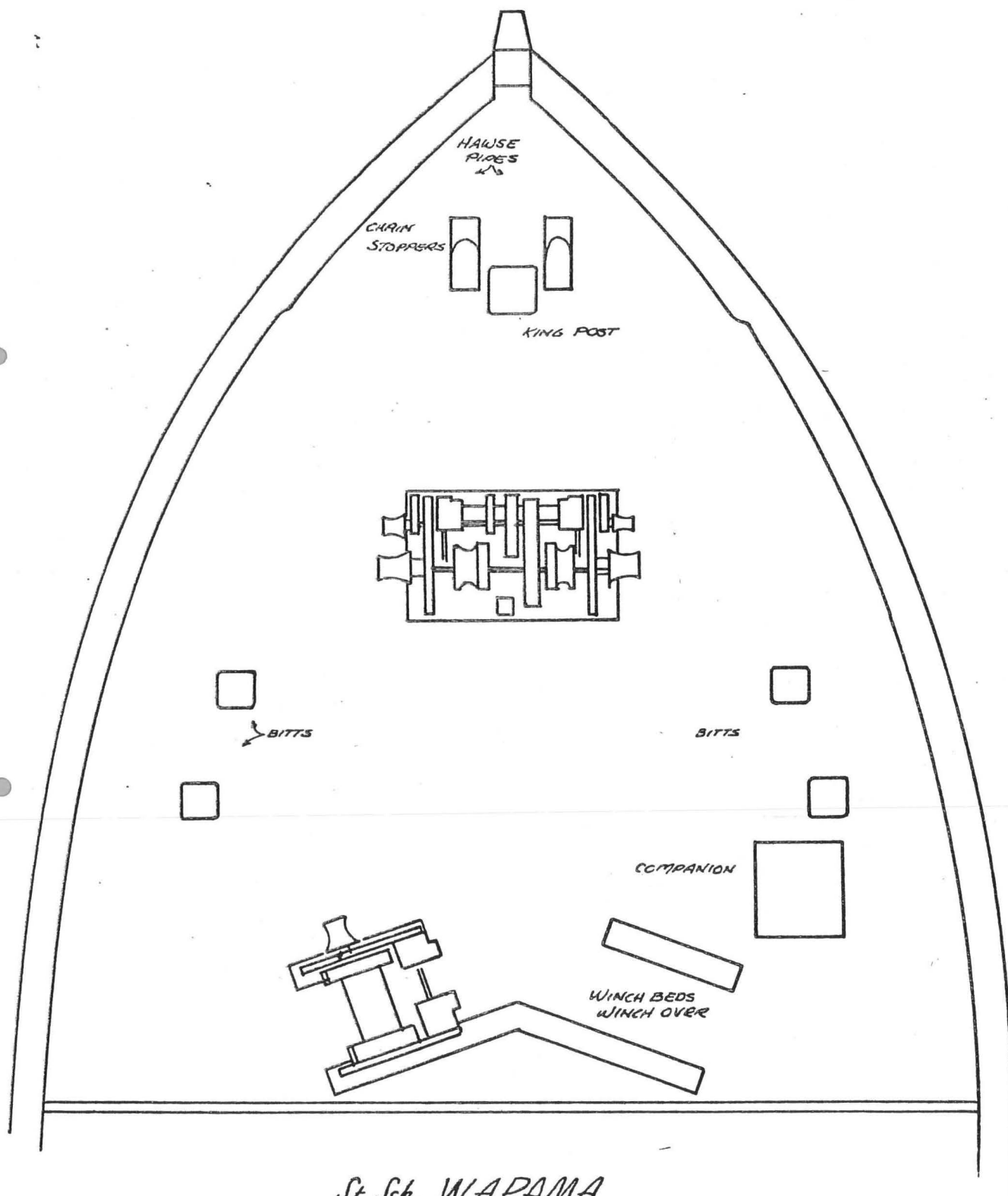
Deterioration of the Forecastle

The forecastle head is in comparatively poor condition, with more or less deterioration apparent in all parts, from the stem-head to the beam at the after end of the forecastle, and including the covering board, bull rails, bitts, winch and windlass beds and decking. The condition of the decking around the machinery beds and at the outboard after ends of the forecastle deck is such that it will require the replacement of most of the decking, and it will probably prove advisable to finish the job with an entirely new deck.

The beam at the after end of the forecastle-head is so far gone

that it may be necessary to replace it completely, and recent removal of some of the decking has shown that the beams forward of this are soft in many spots.

Potentially more serious is the condition of the covering board, which is so soft in many places that it will not admit of recaulking the outer deck seam; this is another of those places in which extreme caution should be used in tearing out rotten wood, lest the job "snow-ball" into a project larger than it is desirable to undertake at this time.



St. Sch. WAPAMA
 FORECASTLE-HEAD DECK ARRANGEMENT
 SCALE $3/16" = 1'$

FORECASTLE:

Comparison with BALCLUTHA and C. A. THAYER

The forecastle of the WAPAMA does not offer the visitor the striking impression of "life at sea" that can be gained by inspection of the crew's quarters aboard the BALCLUTHA or C. A. THAYER. In the case of the former, bare, double-tier bunks are arranged along the cold steel plates of the hull, and the "accomodations" of the compartment are dominated by the massive windlass: the visitor can hardly fail to grasp the idea that when the BALCLUTHA was built there was no compromise made between the convenience of the machinery and the comfort of the crew.

The fisherman's forecastle of the THAYER carries with it an immediate feeling of overcrowding, an effect which will be enhanced when it is fitted out with only a sampling of the fishing paraphernalia and personal effects which made it a "stinking glory-hole" when the schooner was on the Bering Sea Banks.

Qualities of WAPAMA's forecastle

The forecastles of both BALCLUTHA and THAYER partake of the shape and structure of a ship, showing the flare of the bows, the beams, the bolts, and, in the case of the THAYER, closely-spaced knees. The forecastle of the WAPAMA, spacious, squarish, with headroom to spare for an all-star basketball team, packs all of the visual wallop of a dormitory.

The special quality of the WAPAMA's forecastle, from the standpoint of interpretation, lies in the very fact that her barracks-like crew's quarters were a vast improvement over the "dug-outs" that seamen occupied during the sailing ship era. This is a fo'c'sle where sea-bags would still be found, but where sea-chests had been replaced by cardboard suitcases. It is a fo'c'sle comfortable enough for ordinary human beings to stay in -- which they did, for the starboard half of the WAPAMA's forecastle housed the steerage passengers.

Layout and General Condition . . .

The forecastle was originally divided down the center-line, as it is at present, with space for the eight deckhands on the port side. Steerage and crew had their separate toilets on either side, just abaft the forecastle bulkhead. Aft the crew's toilet was the paint locker, and the corresponding locker on the starboard side was for bosun's stores.

Comparatively little repair or restoration work will be necessary inside the forecastle. The paint is in fairly good condition, and aside from removal of vestiges of World War II days in Alaska, little demolition or reconstruction is needed. This forecastle is now a barren and colorless place -- and it always was.

Display Possibilities

If the WAPAMA's forecastle-steerage lacks self-evident display quality, it does present great opportunity for large-scale use of interpretive material. The use of Multiplex panels, which could compress many newspaper photostats, crew pictures, and descriptions of the kind of seaman who sailed in the steam schooners and the sort of life they led

into a relatively small space, would add a great deal of "depth" to the exhibit without giving a "museum" atmosphere to the area.

To speak of interpretive material generally: experience with the BALCLUTHA has shown us that it is most valuable to give the public more than can be conveniently absorbed by the casual visitor in a few minutes. On the one hand, the visitor who wishes to spend the time and effort can satisfy his curiosity and historical interest as fully as he wishes, while the more casual and/or hurried spectator leaves with the feeling that he should come back; both types feel that they have gotten their money's worth, and that a return visit (with out-of-town friends, for example) would not be a waste of time.

Thus, the collection of anecdotes about passage from San Francisco to Seattle in the steerage for \$6.00 (meals in the crew's mess-room included), the collection of photographs and yarns from surviving crewmen, and materials from newspapers or other publications, backed up and tied together with an adequate text, can breathe some life and interest into these cubicles.

PROFILE: WAPAMA

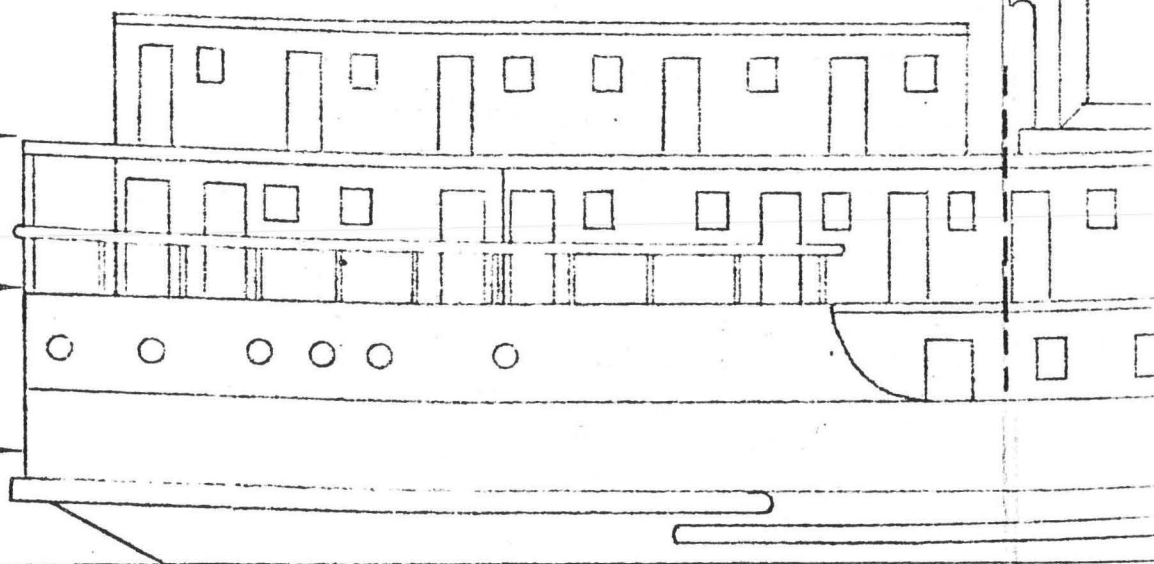
The various decks and structures described in the text may be seen in this outboard profile of the WAPAMA.

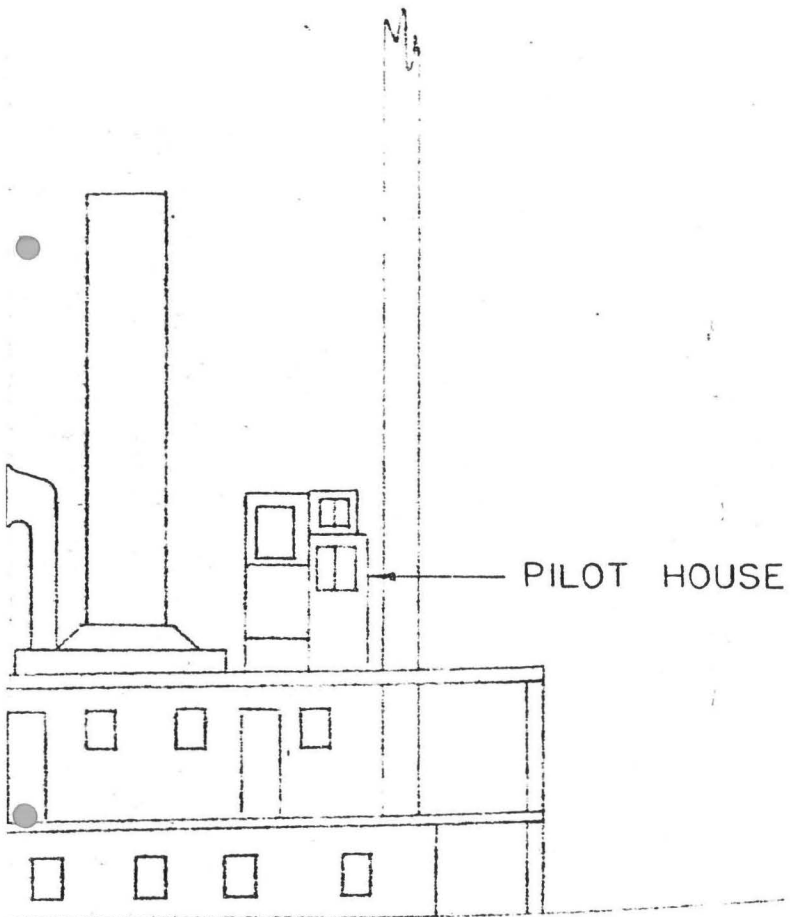
The dotted line abaft the funnel indicates the division between that part of the superstructure which will be restored to a greater or lesser extent during the current program, and the forward part, which must probably wait for a future restoration effort.

BOAT DECK

POOP (CABIN DECK)

MAIN DECK

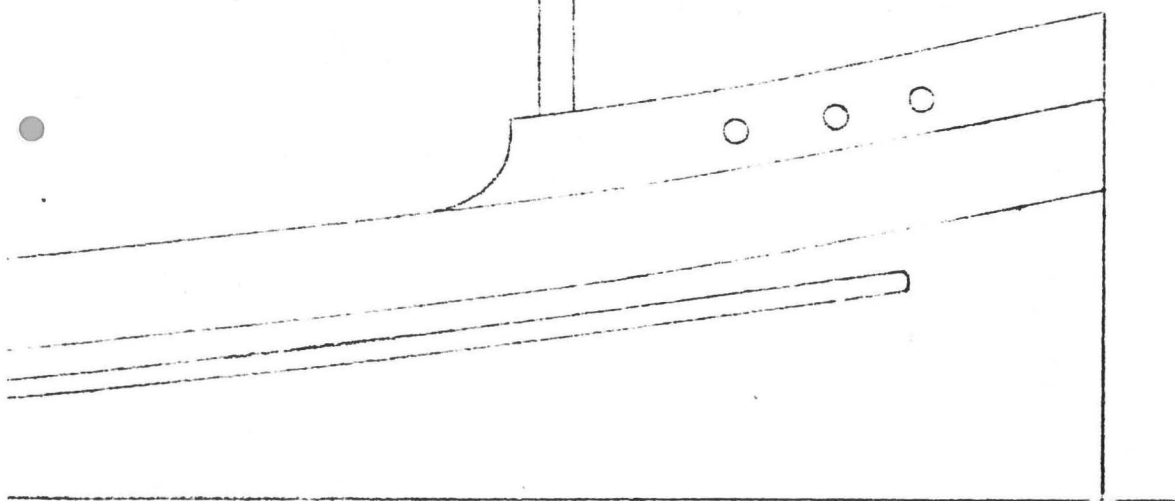




S.S. WAPAMA

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FORECASTLE - HEAD



WAIST

The Main Deck . . .

The essential quality of the waist is its sweeping, unobstructed length: the heavy deck keelsons, massive waterways, and bulwarks, carry the eye in a fore-and-aft direction -- an effect which will be emphasized even more strongly when the deck is smoothed off and the caulking seams between the planks are plainly visible. It will be necessary to dub off the last of the tar and the un-even spots in the deck, reset, and re-plug the fastenings. This is tedious (and as a result, rather costly) work, but the decking appears to be in essentially fine condition, and after it is smoothed and oiled it should look almost as it did in 1915.

Deterioration of the Bulwarks. . .

The badly-scarred condition of the bulwark rail-cap and waterways not only detracts from the appearance of the vessel, but poses a hazard to the public. The rail-cap should be renewed, and the inboard side of the rail dubbed off and a false nosing installed. The waterways can be smoothed up to the extent that visitors with open-toed shoes are relatively safe from the danger of picking up splinters. The rail stanchions (or timberheads) are seriously rotted in many spots, but there can be no remedy at present except liberal application of wood-preservative and cement.

A Deck for Lumber . . .

The long and unobstructed deck represents one of the key design features of the steam schooner -- she was intended to carry a huge deck-load of lumber. One of the most noticeable of the WAPAMA's original

fittings were her sampson posts, one of which was abaft the foremast and the other forward of the main mast, designed to prevent this deck load from shifting as the ship rolled in heavy seas. The posts, 2' square, reached 16' above the deck, and would give the viewer a visual "yardstick" by which to gauge the remarkable height of the lumber loads carried by the steam schooners.

Interpretation of a Function . . .

The procedure for handling cargo, visible on one level of the forecastle-head, will appear from a different viewpoint on the main deck: above, it is the winch-drivers, the technician's view; on deck, men had to come to physical grips with cargo, slinging and unslinging the loads, stowing heavy timbers away, a few at a time. There would seem considerable virtue in having a sling-load of lumber set down alongside the hatch -- offering additional opportunity to explain the manner in which cargo was handled.

It is difficult, if not impossible, to create a cargo-handling scene, for motion is the essence of the activity. Yet a suitable setting presents the opportunity to accomplish in one stroke what we have probably failed to do in the BALCLUTHA with hundreds of words -- explain the ship's purpose in life. It is not the goal, then, to attempt to instruct the public in the principles of lumber-handling, but rather to leave the visitor with a clear impression of how these parts -- winches, masts, booms, rigging, sampson posts, lumber -- fit together into a function.

The main deck also offers the possibility for full-scale visual demonstration of the connection between the steam schooners and the isolated mill towns of the Northwest Coast. A logging locomotive, mill equipment, or other appropriate "hardware" lashed down with chains

on 3" x 12" dunnage would not be at all out of place on the WAPAMA's deck. The general appearance of the waist after the restoration effort should determine future policy with regard to such deck display; not only must general aesthetic interests be weighed against immediate display values, but it is not impossible that it may be desirable to distract the public from too-close contemplation of deck details.

The Hatch

The single large hatch of the WAPAMA -- typical of the steam schooners -- has a special impact of its own: the visitor will feel the stimulation of peering into a great maw, of looking into the very bottom of the ship from a height. The hatch should be displayed open, to preserve this impact and to provide the maximum natural lighting for the hold; it is the dominant "display" on what would otherwise be a comparatively featureless deck, and it should be employed to maximum effect.

The impression that the WAPAMA may leave on the visitor could well be that of popping into and out of a host of wooden cubicles, forming, in toto, a ship. The cavern of the hatch, with a visit down into the hold itself, will vie with the engine room and passenger dining saloon as areas of major dramatic interest.

Unfortunately, the hatch cannot be left in its pristine condition:

- 1) A railing must be erected around the hatch to prevent the unwary sightseer from sharing the fate of quite a few steam schooner sailors;
- 2) The hatch seems to represent the likeliest means of access to the hold, and a stairway must be designed which will preserve the visual effect of space and depth as much as possible;
- 3) During rainy weather it will be necessary to provide some sort of shelter over the hatch --

an awning rigged from the ship's cargo gear, similar to the type used to protect the hatches of working ships during cargo-handling operations, might prove the most pleasing solution.

Forward End of Superstructure

The main deck area, bounded on the one hand by the lofty mast and the extra-long booms that are found in a steam schooner, and floored with the interesting cavity of the ship's hatch, is bounded at the after end by one of the most striking features of the ship -- the forward end of the house. While it is characteristic of steam schooner construction it has some of the derivative striations of the totem pole. The heavy, square, upright timbering could be sawmill construction rather than naval architecture, although the large wooden knees framing the winch platform (more prominently displayed here than anywhere else on the ship) are unmistakably maritime -- wooden ship architecture in its purest essence.

Three levels of utility appear as we look aft at this primitive tower: Quarters in the lowest level -- enclosures where firemen and winch drivers lived; above, the winch platform, equipped with efficient-looking machinery -- an area of utility, connoting exposure and men at work; and at the top, the pilot house -- pivotal point of the ship's management.

Some of the elite quality of the pilot house is conveyed by its curved face, by the high bridge wings -- occult realm of the navigators. Threaded through the entire structure is the main mast, soaring finally over the whole. By reason of the structure from which it emerges, however, this spar appears less distinctly "mastlike" than the free-standing foremast. Most probably, the booms of the mainmast should be lowered in their "seagoing" position, with their ends on deck, or lying in rests

on the sampson posts, so that their scale can be appreciated.

Condition of the Forward Superstructure. . .

In this stage of the WAPAMA's restoration we may have to remain content with the visual impact of the forward end of the superstructure and forego the repair work which will be necessary before the public can be admitted to the various levels. This structure, from the pilot house down through two decks, is in an advanced state of deterioration -- so far advanced that any attempt at more than superficial repair will involve extensive rebuilding.

Those knees under the winch platform -- which immediately attract the visitor's eye -- are hollowed-out by dry rot; severe leaks between the pilot house and fidley have rotted decking and beams not only on the boat-deck level but down through two decks, into the bulkheads and sheathing of the firemen's quarters on the main deck.

Fortunately the external appearance of the superstructure from the fidley forward is not too bad. The bulky, unsightly, and thoroughly rotten bridge wings will be entirely removed and replaced by the small, light, folding platforms which appear in early photographs of the vessel. The pilot house itself provides a very difficult problem for public access; proper repairs to the structure will involve replacement of the deck and beams underneath; thus, it will most probably prove expedient to merely attempt superficial repairs designed to improve the external appearance of the whole structure.

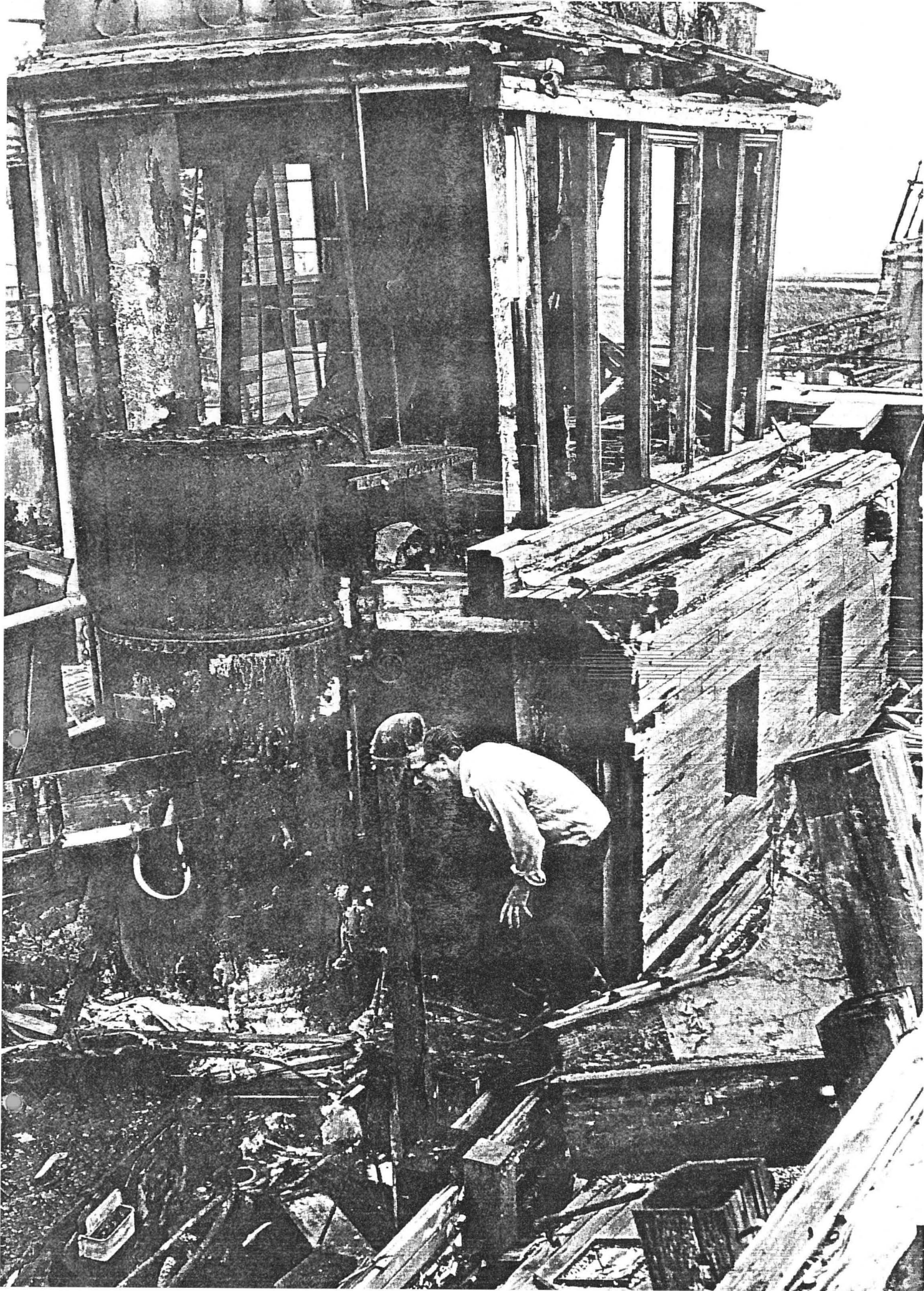
The officers' quarters on the deck below, immediately abaft the winch platform, are also in an advanced state of deterioration, but here again public access would be difficult -- and not vitally necessary -- even under happier conditions.

CONSTRUCTION DETAIL

Forward End of the Super-
structure . . .

This "cutaway" view of the CELILO's superstructure shows the heavy construction of steam schooners and the potential magnitude of what may start as superficial restoration.

The WAPAMA is badly deteriorated around and under the funnel casing (top), and years of fresh-water leakage have resulted in rot spreading downward through the cabin-deck (center).



This whole forward end of the superstructure, then, must probably remain comparatively "untouched" during this phase of the WAPAMA's restoration, unless it should appear within the next year that the currently available funds will stretch further than they would seem to at this time.

The "Boneyard"

The alleyway on either side of the superstructure (sometimes called the "boneyard" by outside port sailors who had to carry redwood ties back there from where they had been landed on deck by the wire) is of the characteristics of the single-ended steam schooners. The purpose of the alleyway was to provide uninterrupted deck space for stowage of long timbers. The picturesque quality of this arrangement, which would be apparent in the intimate atmosphere of a small steam schooner, is largely lost in the massive WAPAMA. It is one of the least interesting areas aboard the ship -- and should probably be left that way.

As pointed out above, the display quality of the restored firemen's and winch drivers' quarters is not great, and it will probably prove uneconomic to attempt their restoration at this time. The saving grace in the uninterrupted wall of horizontal tongue and groove is the door to the engine room. Although the public might not be allowed to enter here, a look inside gives a tantalizing preview of the machinery that fills this end of the hull. From a display standpoint (not to mention practical benefits to operation of the ship) the donkey boiler restored to operating condition -- fired-up, hissing, being tended -- would convey the "steamship"

message more pointedly than all of the massive machinery in the engine room.

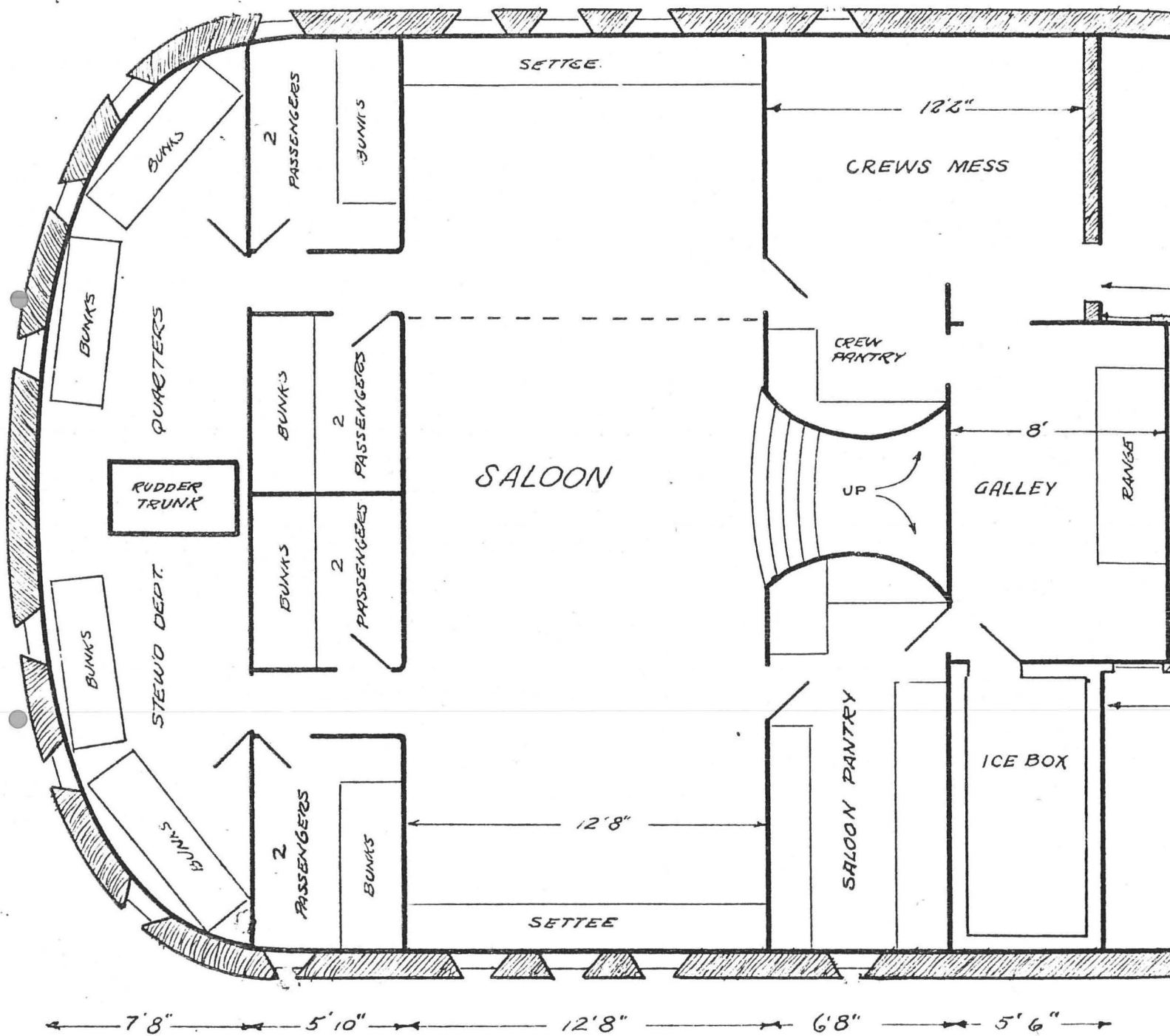
Another source of relief from the painfully plain effect of the "boneyard" can come from restoring the iron-bark stanchions which at once support the forward part of the boat deck and serve as chafing-pieces to protect the T and G sheathing of the lower part of the superstructure from damage by lumber piled in the alleyways, to their original "bright" (oiled) condition. These almost-black uprights, against the white of the house, with the horizontal line of the gray moulding of the cabin deck, will break up the surface into a much more appealing pattern than the present mono-coloring produces.

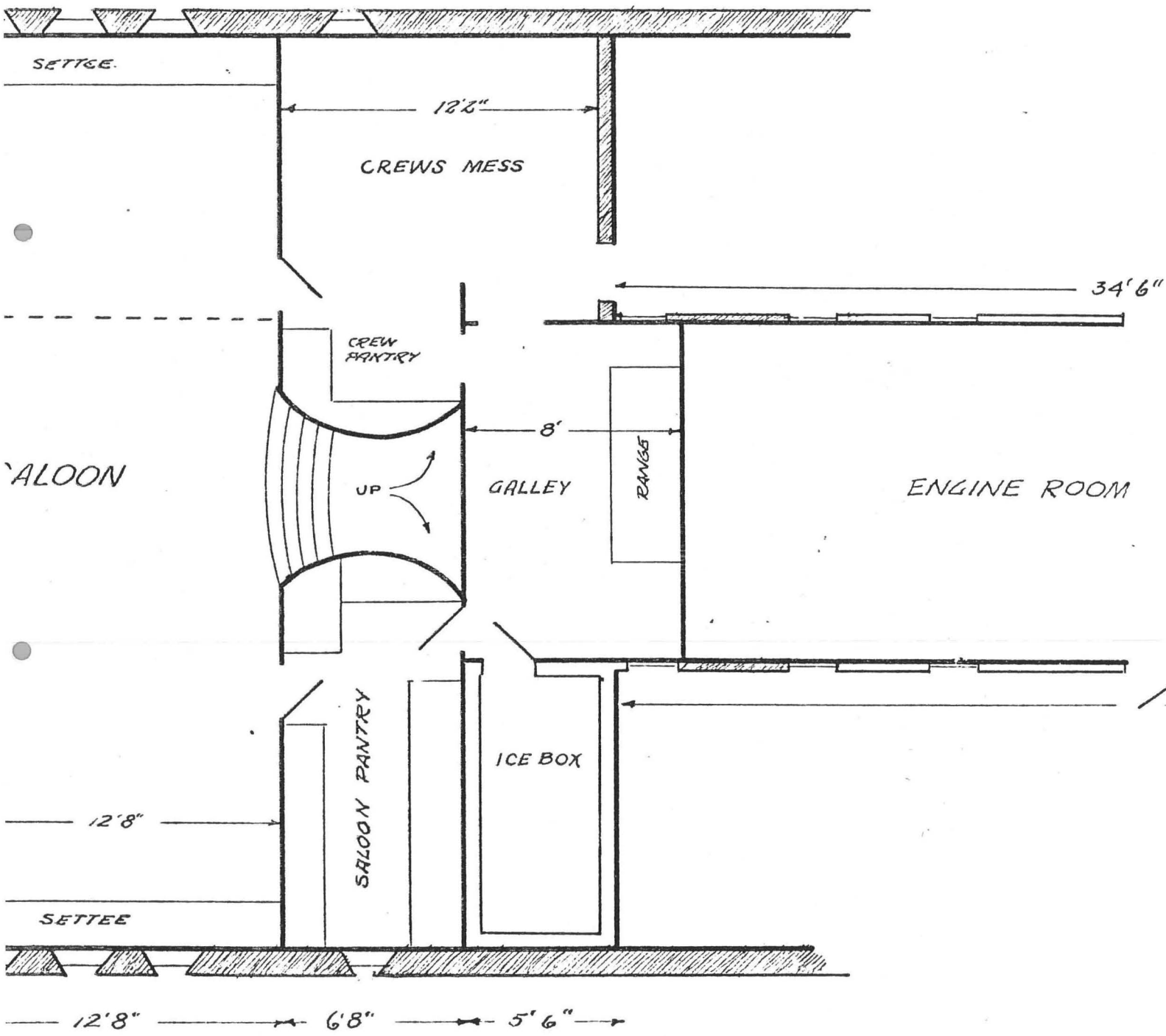
UNDER THE POOP

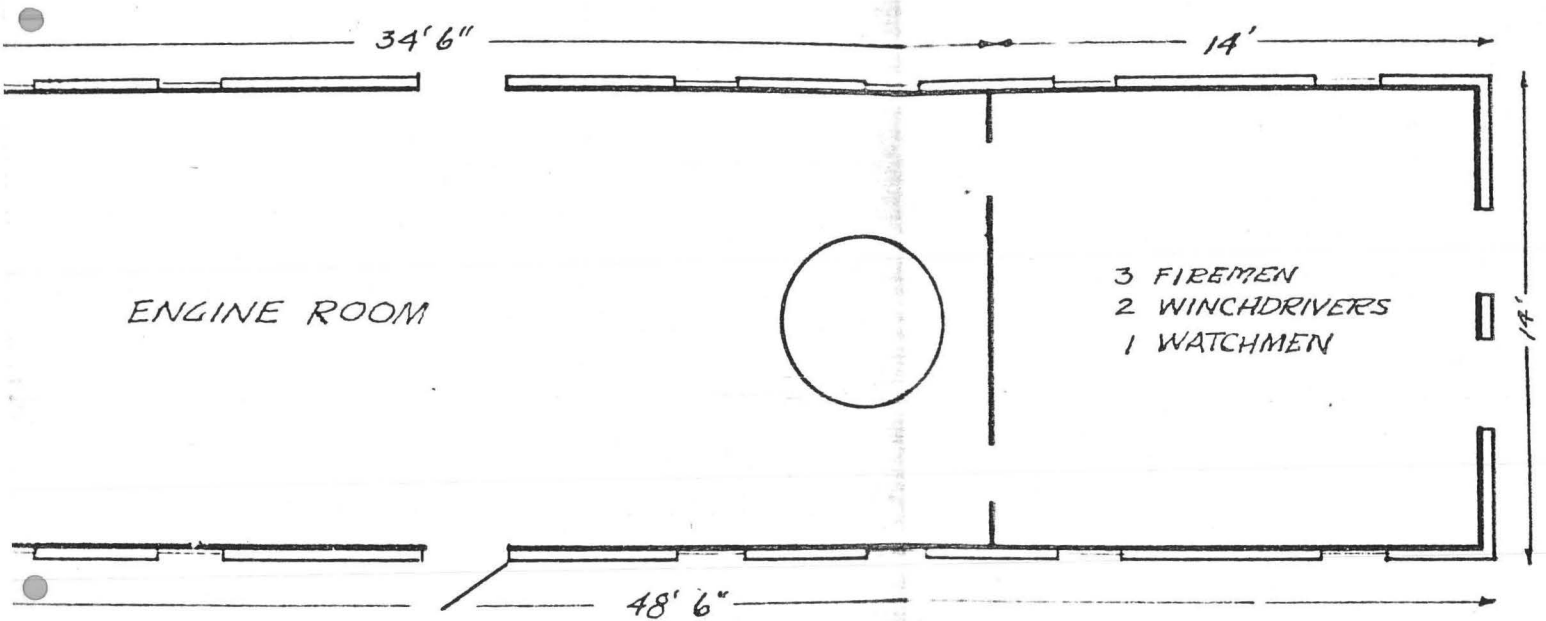
Galley, Pantry and Crew Mess Room

Because of the narrow doorways at the break of the poop, the public should probably be routed "one-way" through the galley and dining saloon. Assuming that the visitor comes over the bulwarks and into the waist, he would step almost directly from the "boneyard" into the galley. This arrangement is most fortunate, for after the expanses of the essentially empty waist and alleyways, he will be immediately assailed by the human dimension.

The arrangement of the doorways between the "boneyard" and the galley lead the visitor through what was once the crew and steerage mess room -- a space which is now occupied by a sort of scullery as well as storerooms. Restored to its original appearance with both table and chairs (the precise arrangement of which research has yet







ST. SCH. WAPAMA
MAIN DECK ARRANGEMENT
SCALE - $\frac{3}{16}'' = 1' \text{ FOOT}$

to determine), this area will give the visitor first a glimpse of a plain eating area, followed immediately by entrance into the galley itself.

This is an excellent galley from the display standpoint, its greatest virtue being that the visitor can walk right through it. It is filled with good details: the crude dishracks and tongue and groove cabinets pierced for ventilation still have the air of St. Helens and 1915 about them; the sink and the handpump, the exposed wiring, are excellent touches. This is a graceless galley -- straight out of a graceless era. Far less than the BALCLUTHA's galley does this drab cell need the clutter of worn knives, dishes, and other artifacts to make it thoroughly convincing.

The pantry repeats the message of the galley, insofar as fixtures and style are concerned, but it also gives the visitor his first "bowels of the ship" impression with its single wan porthole. An air of imprisonment attaches to the galley, scullery, and pantry; this was the habitat of a long line of pale dishwashers and stewards -- a lesser race than the vikings of the open decks or the Vulcans of the "black gang".

The pantry is the vestibule to the dining saloon, and the first down-to-earth hint that this was a passenger ship. The existence and size of this room betray the fact that there were others who traveled up and down the coast on this beside the crew; it speaks for the amenities that the day, the trade, and the price of the ticket permitted.

The arrangement of the pantry is such that it is possible to block entrance to the major portion of the room, while permitting free access through the pantry to the dining saloon. It will be most desirable to

equip the pantry with china, cutlery, and other artifacts which might have been found there, though it would certainly be best, from the display standpoint, if some means can be worked out to "nail down" the small display pieces and do away with a barrier any more formidable than a light rail or rope.

Dining Saloon

The dining saloon originally stretched the whole width of the ship, and should be restored to these dimensions, although, even in its present state, it is an impressive room. Except for the cargo hold, it is the noblest room in the ship. Here a conscious attempt seems to have been made by the builder to wipe out the atmosphere of the mean little cabins and cramped after decks with a single gesture.

Meals were the most notable events during the passengers' day. The entrance to the dining saloon prepared for in the little cabins, represented the only attempt at social array possible on short coastal voyages. Hence the diminutive grand staircase, leading from the passenger lounge to the saloon.

The saloon is a handsome ship's room by any standard, with its excellent proportions and low ceiling. The general decor could not be much improved. Three ports at either side are treated in a manner which emphasizes the thickness of the ship's sides; the overhead is serrated with deck beams -- ornamented slightly with mouldings; the housed-in knee between each port is a reminder of her mode of construction. The ports, with their delicate glimpses of seascapes, the unexpected elegance of the "grand staircase" and the gentle arc of the deck beams

spanning the room are the three major reasons why this dining saloon has a real "style".

The furnishings tell a different story. The tables and chairs (and the tableware, one suspects) reflect a homeliness that is in the character of the period. The stiff, precisely arrayed, varnished chairs are of the same unyielding stuff of the "Mission furniture" period.

But there is more to this saloon than a room full of furniture suspended between Professor Eames and Van de Velde: This room -- with all its chairs with sculptured seats and curved backs -- is a dedication to people. People en masse, in convocation; not the scattered vestiges seen elsewhere -- a few bunks forward, a winch platform, room for a cook to stand or a pantryman to wash dishes. Where the perceptive visitor might visualize lumber in the hold, or motion in the engine room, here he immediately sees people, a vanished and variegated little company of Americans from a departed era.

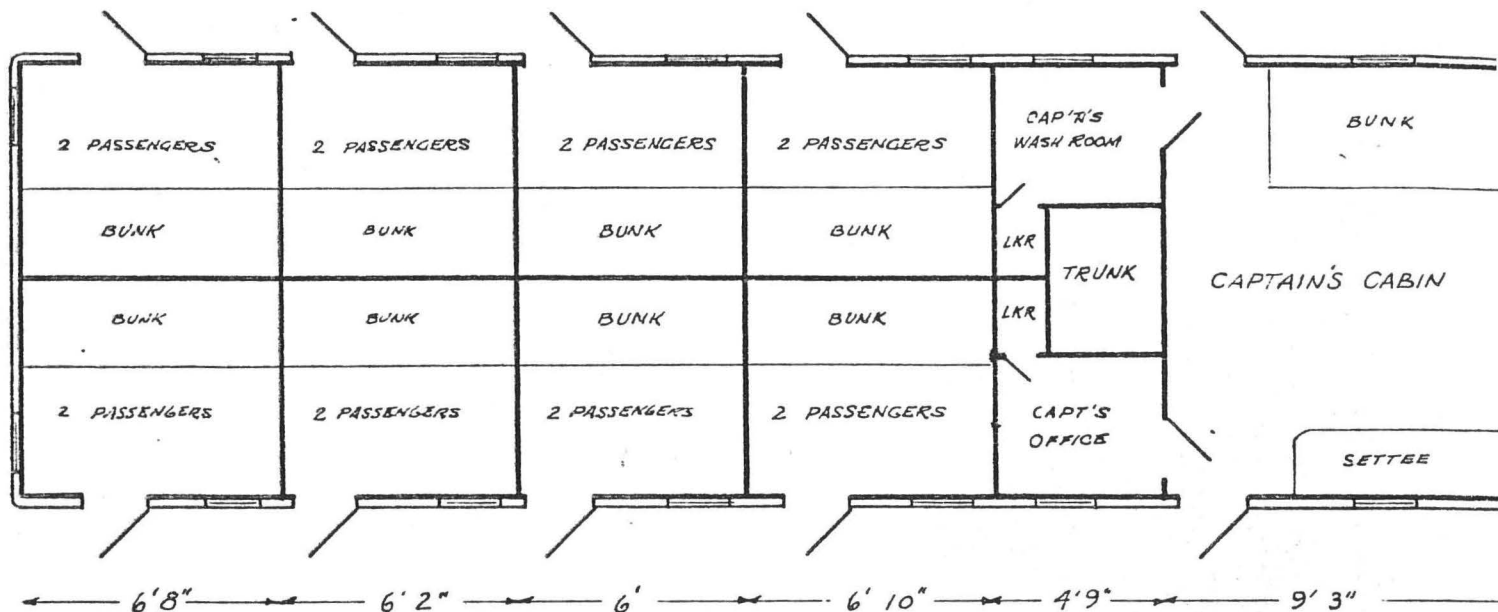
Localized leaks through the poop deck, particularly out near the sides of the ships, have resulted in serious deterioration of the saloon paneling in places. The large deck beam at the after end of the galley is also rotted in spots, leading to the conclusion that some of the beams in the saloon may be in poor condition. However, it should not be necessary to launch into the major work which extensive repair or replacement of these beams would entail.

After Cabins

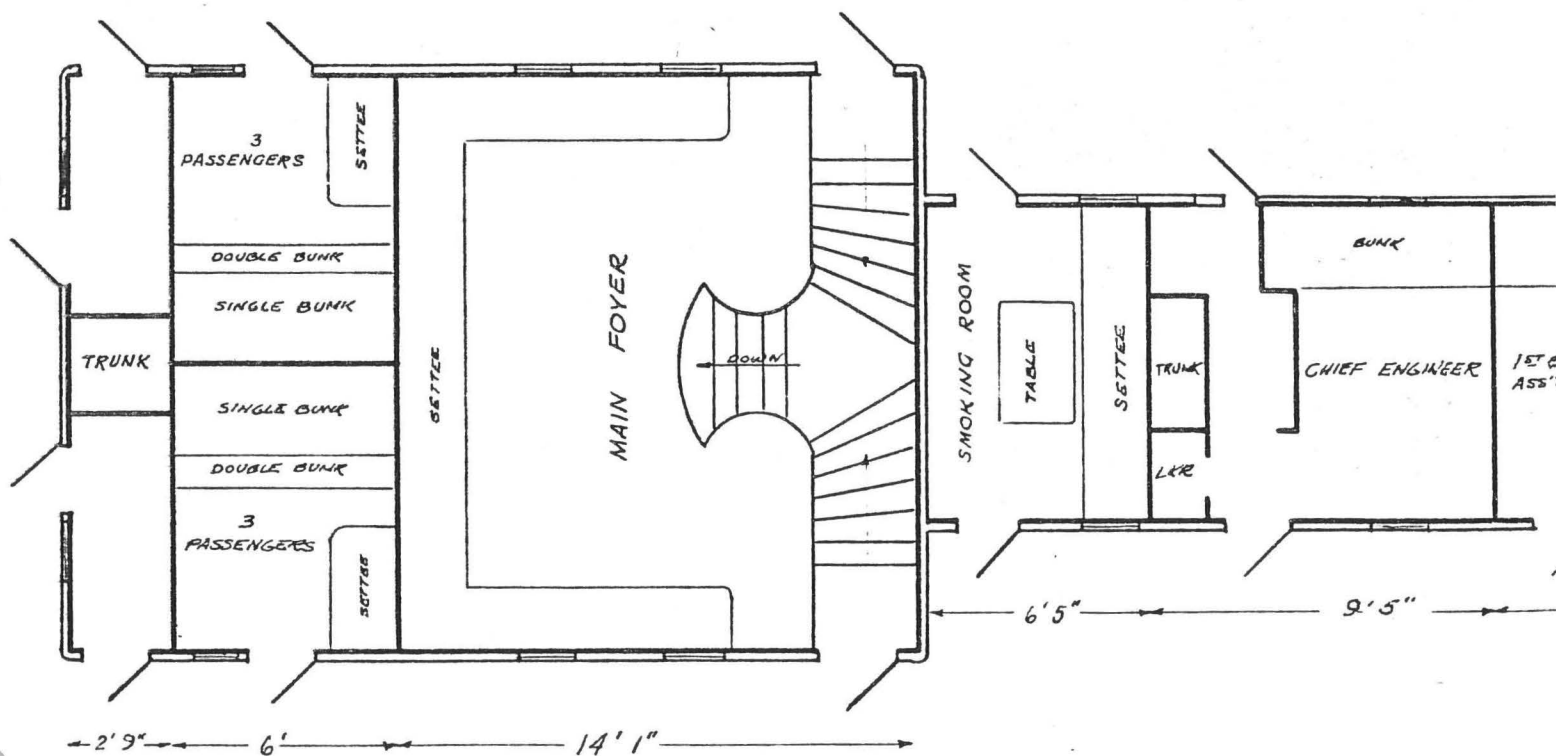
Of the six cabins abaft the saloon, the four adjoining the saloon bulkhead (two outside, and two interior cabins) were for passengers, while the two large cabins in the very stern were occupied by the steward's

department, the steward occupying that to starboard, and a cook, pantryman, and two waiters that to port.

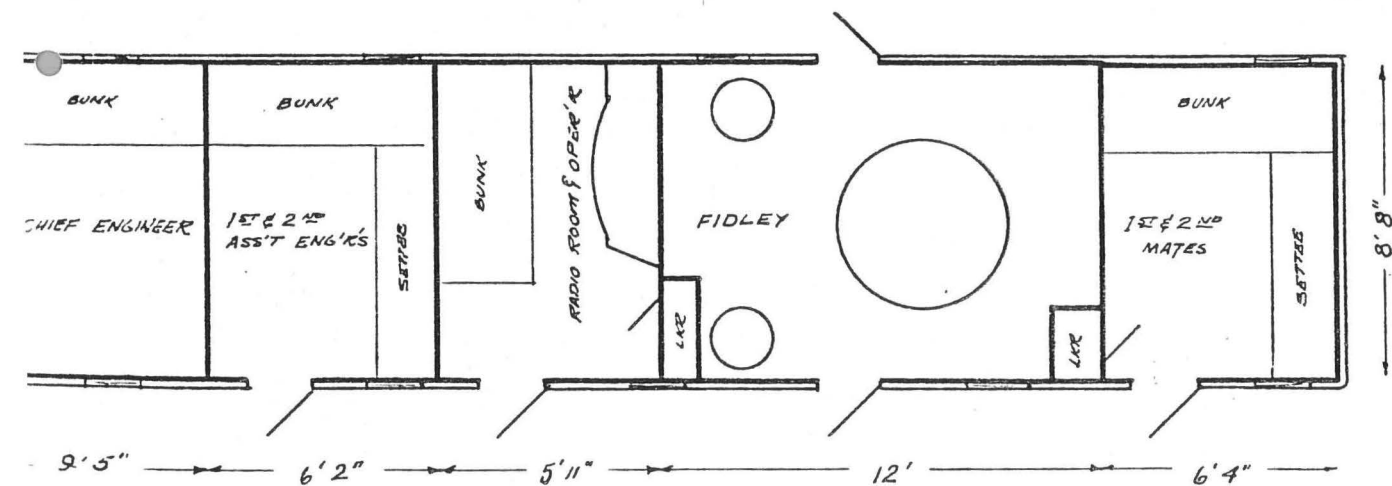
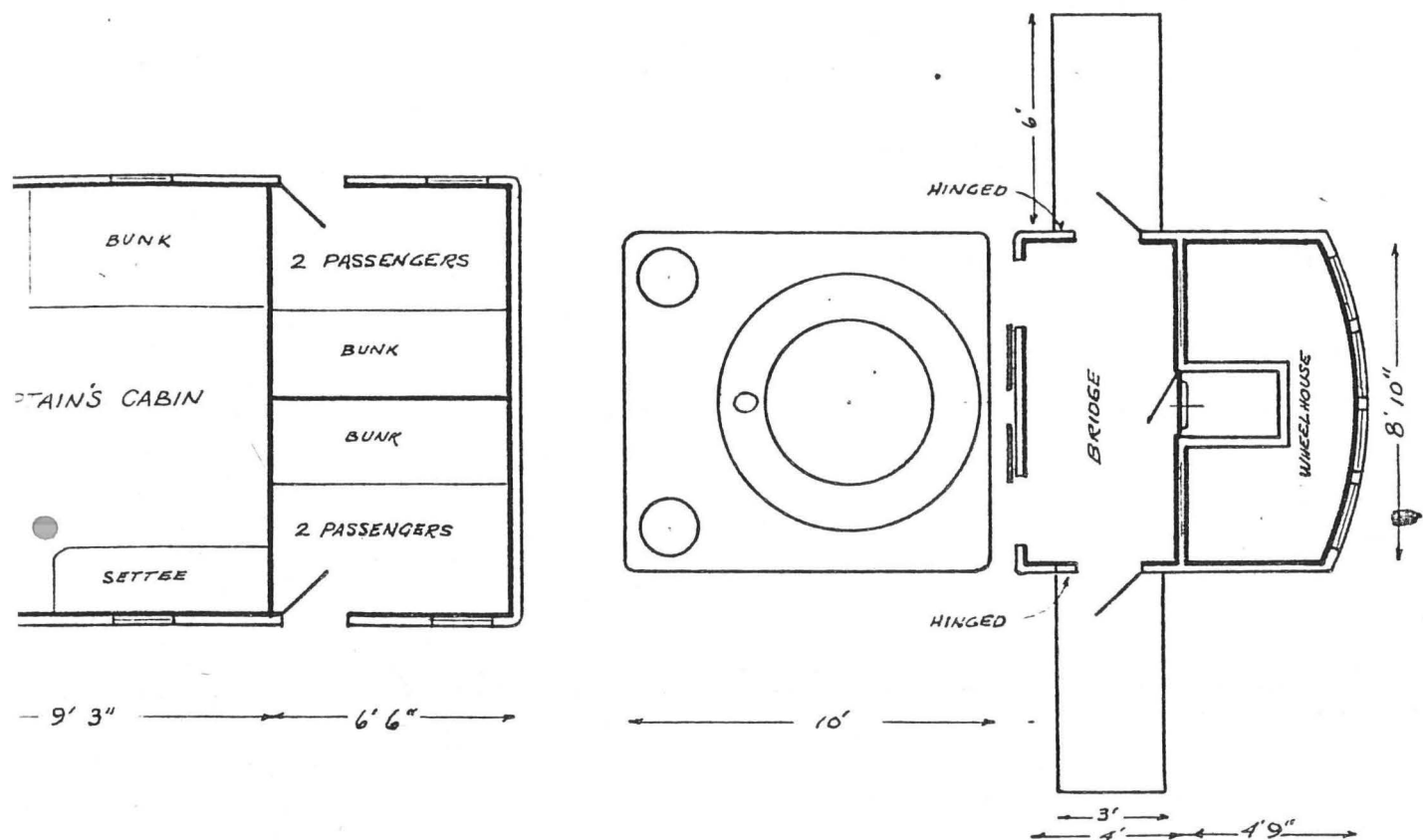
There would seem little point in restoring these cabins for public display during the current project. A curtain, tied back to give the public a glimpse of the louvered doors to the cabins may mark the limit the public is permitted to explore.



BOAT DECK



CABIN DECK



ST. SCH. WAPAMA
CABIN ARRANGEMENT
SCALE $\frac{3}{16}" = 1 \text{ FOOT}$

POOP DECK:

"Grand Staircase" and Lounge

The path of the visitor leaving the dining saloon leads him up the curving varnished staircase (with its large mirror over the landing) into a spacious lounge. This lounge originally served as a "social hall" for the passengers, and was fitted with a red plush settee around three of its sides. Here passengers could gather for conversation -- or even singing to the accompaniment of a small piano set against the center of the after bulkhead.

The fancy paneling of this room is almost completely ruined, and deterioration of the studs and sheathing is far advanced in places. Here is a case where the major portion of the structure can be saved, but where the patching and replacement of parts assumes the proportions of a major rebuilding job. Generally, the entire superstructure on this poop level is in the same condition, and for this reason it would seem wise to attempt restoration of only those areas which are of special interest at this time.

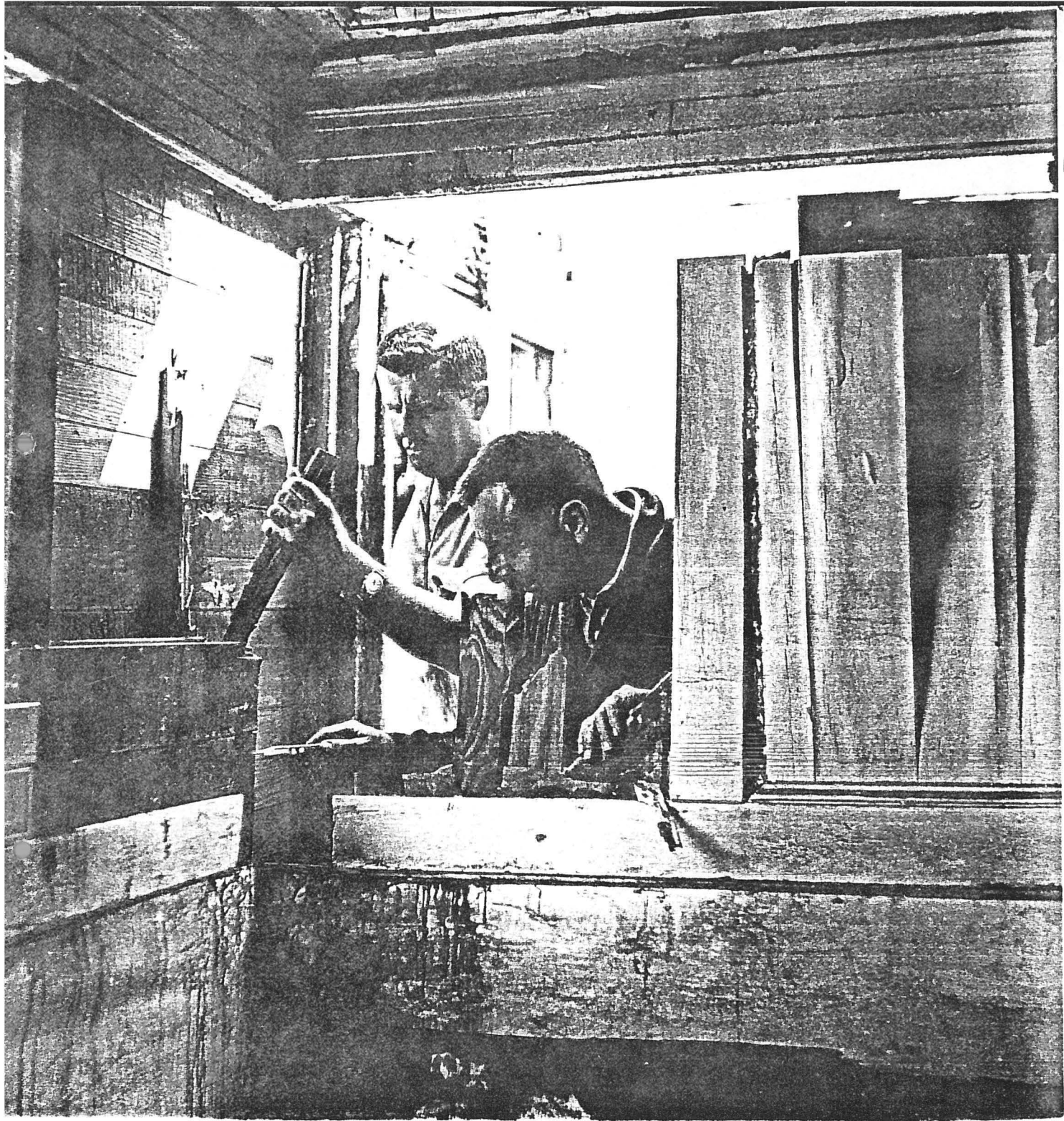
Smoking Room

Forward of the lounge is what was formerly a small smoking room, accessible through doors opening onto the poop deck at either side. This room had a bench along the forward bulkhead, a narrow table running athwartships, with two or three swivel chairs (similar to those in the dining saloon) on the opposite side of the table. This room, while an interest-

HIDDEN ROT

Restoration and Maintenance Supervisor Harry Dring (left) and Harold Sommer, Maritime Museum restoration expert, probe the rotten paneling and structure of the WAPAMA's lounge.

The removal of buckled panels reveals rotten sheathing, which in its turn conceals deteriorated studs. Thus, while it is possible to judge the probable extent of the restoration which will be required in any given area, it is difficult, and often impossible, to determine what repairs will be necessary in detail.



ting part of the passenger accomodation, and entirely accessible from the standpoint of public circulation, is not so important that its restoration should be considered on a priority level with the engine room, galley, saloon, or lounge -- nor is it so important a display as the forecastle or the passenger cabins abaft the lounge.

Passenger Cabins

The two largest passenger cabins were those opening on to the poop abaft the lounge. Their restoration (or the restoration of at least one of them) will serve to give the visitor a sample of the passenger accomodations of the WAPAMA. Originally these cabins were "triples", with a double bunk and an upper single. One of these cabins might be fitted out with the type of personal belongings, luggage, etc., of the coastwise traveller of the 1920's.

The remainder of the passenger cabins were located on the boat deck, and it would seem unnecessary, at this time, to present more than a single example of the accomodations.

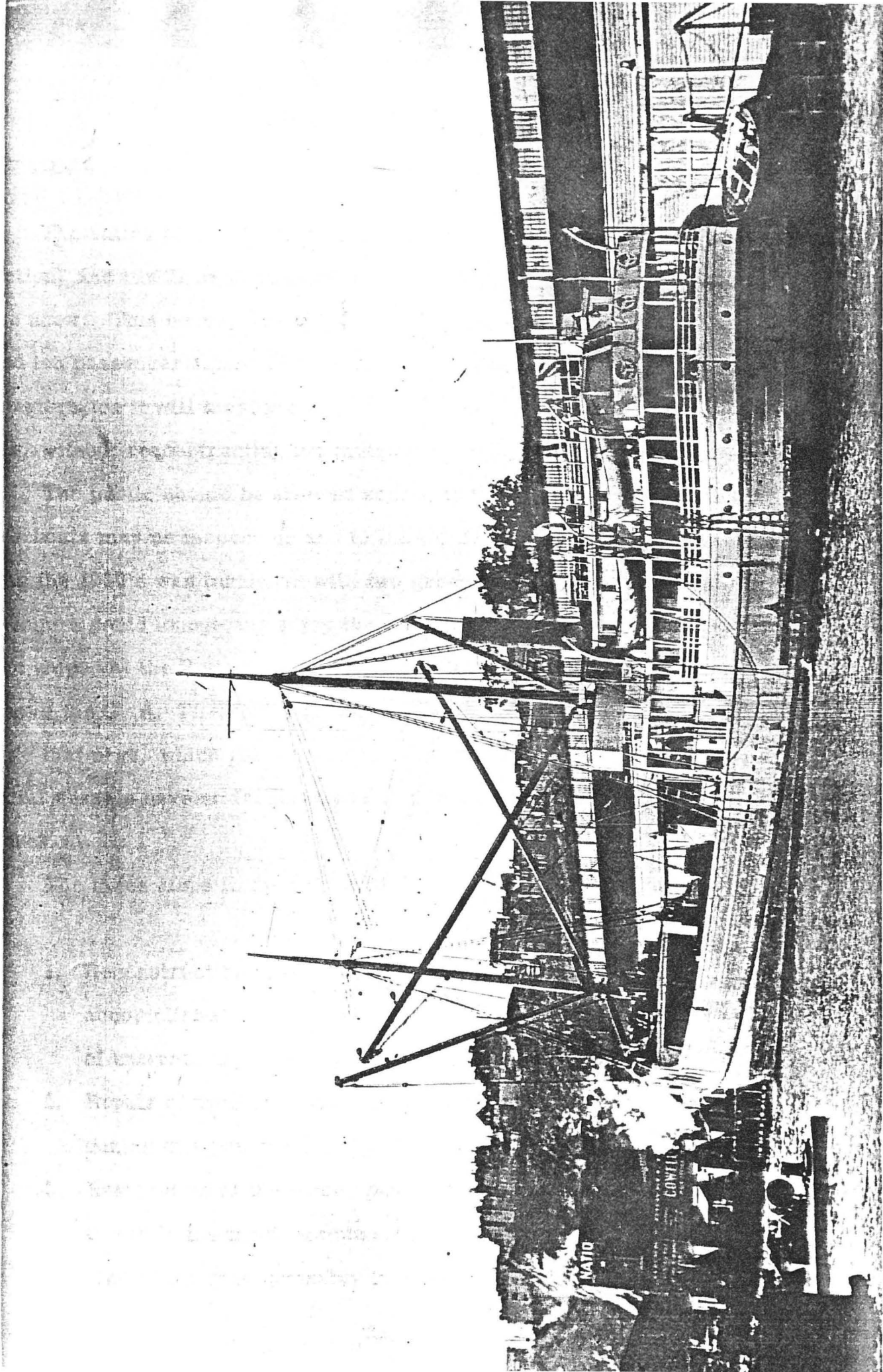
The poop deck is the most intimate of the WAPAMA's deck areas, and the most attractive. Here, after emerging from the lounge, the visitor will be able to see wooded Black Point across the Aquatic Park Lagoon from the comparative shelter of a sort of "marine veranda," with the caulked deck underfoot, curving rail and turned stanchion before him, tongue-and-groove sheathing and louvered doors behind him, and arched beams overhead. The capstan dominates the center of the after portion of the deck, mooring lines will come aboard to the bitts at either quarter, and forward will be a vista of the whole length of the deck and the fore-castle head.

WAPAMA AT SAN FRANCISCO

October 22, 1931

This view shows the WAPAMA as she appeared when she was operated by the Los Angeles-San Francisco Navigation Co.

Compare with the appearance before alteration (following page 44): sampson posts have been removed from either end of the hatch and replaced by winch-driver's platforms -- a result of abandoning the lumber trade for general cargo; the bridge-wings have been extended, and the small toilet room added at the after end of the boat deck house.



BOAT DECK:

The entire after portion of the boat deck is in the process of reconstruction, and it will be necessary to rebuild the whole of the boat deck house anew. This house, stretching from the fidley to near the stern, contained ten passenger cabins and the captain's cabin. During this phase of the restoration it will most probably be possible to rebuild the shell of the house, without reconstructing the interior.

The public should be allowed access to the boat deck, where the ship's boats may be inspected, and to the top of the boat deck house, which during the 1920's was furnished with two green park-type benches, where passengers could lounge and enjoy the view from the highest vantage-point on the ship. At the Hyde Street Pier, this view will command the entire sweep of the C. A. THAYER's decks, immediately astern -- and should satisfy that urge, which passengers of the old ferry-boats and other commercial vessels have so frequently felt, to get up on the usually "off-limits" top deck.

The three steps in the restoration of the boat deck for public display are:

1. Reconstruction of the shell of the house (which should be accomplished during the current program in the interests of external appearance, if nothing else);
2. Repair of the life boats (which should also be possible during this program);
3. Restoration of the large, panelled captain's cabin, which is easily the most sumptuous of the quarters in the ship (and which must probably be postponed to a later date).

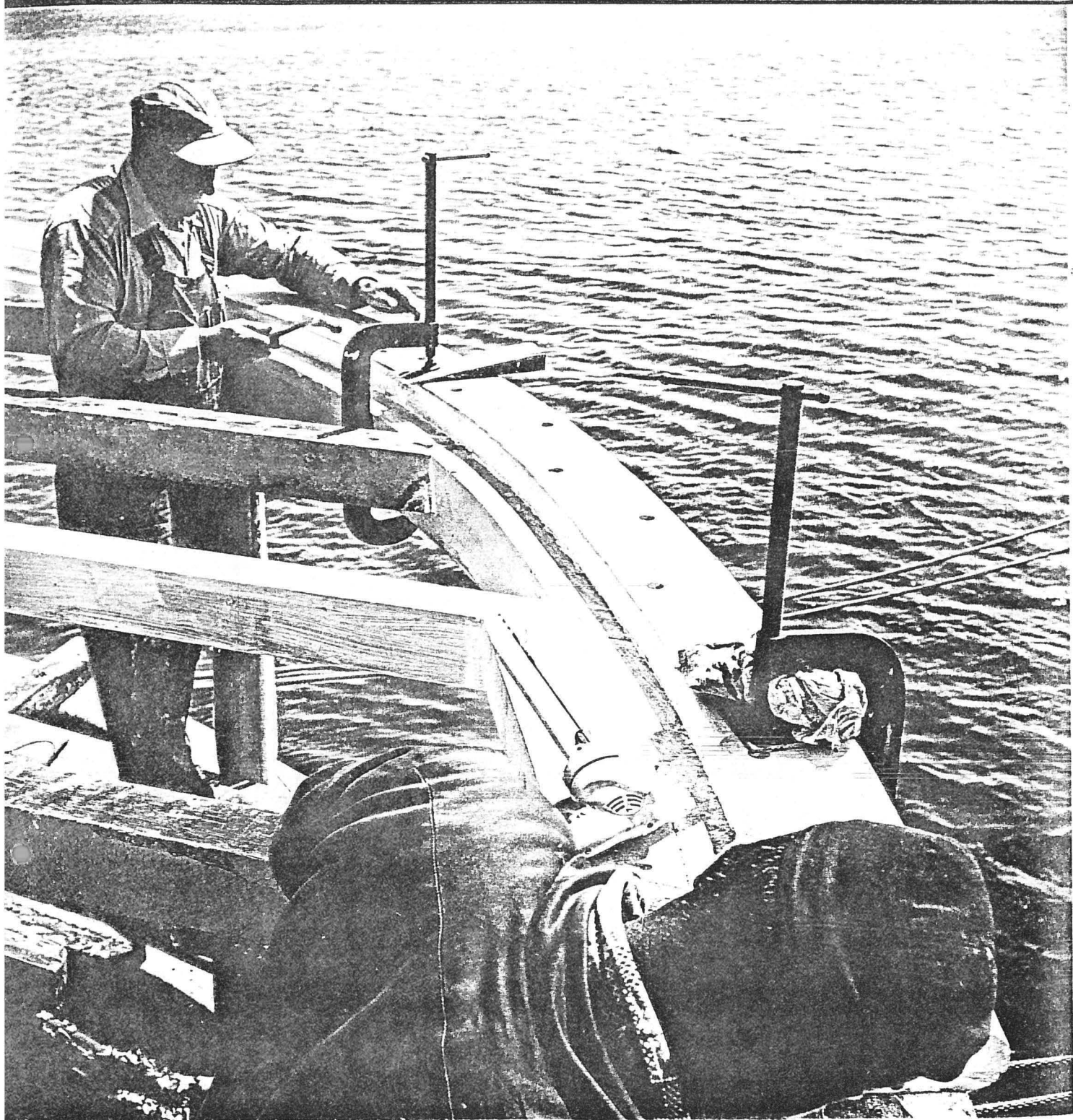
REBUILDING THE BOAT DECK

An Exhibition of Outdated Skills. .

Shipwrights Al Pasquinucci and Clifford Reals install the covering board over the new plate for the WAPAMA's boat deck.

Heavy shaped timbers offer one of the most striking distinctions between ship repair and most "shoreside" construction. Note that the stanchion and three of the beams are old, while one beam, the massive plate that the beams are notched into, and the covering board, are new.

It is in such work as this that great savings have been made by employing highly-skilled shipwrights rather than letting the work out on contract. The slow pace of this tedious piece of work did not affect other jobs, and by careful selection of used timbers from a wrecking firm it was possible to save about \$300 on the lumber visible in this photograph.



ENGINE ROOM:

Condition

In the above tour of the WAPAMA, we have bypassed the engine room -- the very heart of the ship -- as it represents the knottiest problem from the standpoint of public circulation, as well as being one of the largest restoration jobs. The main engine, and all of the auxilliary engine-room gear, was left in deplorable condition by the scrappers who formerly owned the ship: the machinery was partially dismantled, and most of its brass parts sold, and the remainder left lying about to rust.

Fortunately, some of the missing parts can be "cannibalized" from the abandoned steam schooner CELILO and the tug W. B. STOREY, both of which had engines of almost identical dimensions; other parts can be made, and it will be possible to put together an engine room again.

Significance

The WAPAMA represents very nearly the ultimate in the development of the wooden coastwise carrier: she is to 1915 what the C. A. THAYER is to 1895, and her engine room is as vital to her interpretation as are the THAYER's masts and booms to her presentation. Thus, despite the difficulties faced in restoring the engine, and in routing the public through the engine room, the omission of this area from visitors' tours would be almost comparable to the display of the THAYER without her rig.

Not only is the engine room the heart of the vessel, but the 'up-and-down' steam engine is as obsolete as the steam locomotive and will soon be a rare antique. It is also extremely doubtful that many of the vessel's potential visitors have ever seen a marine steam engine in its natural habitat, much less a triple-expansion engine sitting in the bottom of a

wooden vessel.

It would be a simple matter to run the visitors across the upper engine room, giving them a superficial taste of "machinery" and a view of the cylinder-heads. But it is not until one stands in the very bottom of the engine room, looking up and through the rods and links and bearings, that the full impact and life of this machinery can be felt.

Access

The engine-room ladders were designed firstly for the convenience of the machinery and secondly for the convenience of reasonably agile engineers. More or less extensive modification of existing ladders or installation of alternative means of access must be undertaken in order to permit public entrance. The following possibilities suggest themselves:

1. Hatches can be cut through the main deck in the "bone-yard", permitting the public to enter down a fairly easy ladder on one side, pass forward alongside the engine, cross over to the other side in front of the boilers, and exit via a ladder opposite the one by which they entered.

This modification of the existing arrangement would provide the safest and most efficient circulation pattern. But it represents a costly undertaking and entails serious departure from the original layout.

2. A variation of the above, less costly and less destructive of the historic integrity of the engine-room (and main deck) would be to install only the portside hatch and ladder for access, employing a modification of the existing ladder for egress. In this case the traffic pattern would be about the same. The steep engine-room ladder, while difficult

to negotiate in descent, would be reasonably safe and easy to climb.

It should be noted that some modification of the present ladder is probably necessary if the public is to use it at all, for it presently requires one to duck under a carlin while negotiating a turn.

This arrangement still requires cutting one hatch through the main deck. Thus, although it may be held that it is only half as objectionable as a plan calling for two hatches where there are supposed to be no hatches, it still compromises the historical integrity of the ship.

3. The third possibility is the installation of a second ladder alongside the existing engine-room ladder, together with the necessary modifications in landings, etc.

This system would be more in the spirit of the original layout, but it poses considerable difficulty in establishing a good traffic flow, and many people would undoubtedly be deterred by the steep ladder.

4. The present ladder might be modified so that it drops directly to an extension of the existing auxiliary flat, the pitch of the ladder being reduced in the process as much as is feasible (which is not much). Here the public would simply be expected to cope with a standard engine-room ladder arrangement; existing hazards and difficulties would be removed only insofar as this can be done without changing the general spirit of the original.

The virtues of this installation are its historical integrity and its economy.

Its defects are the hazards of negotiating the ladder and the serious "bottleneck" the single ladder will impose on the traffic flow. However, it may be said that the one ladder is no more dangerous than the double-ladder installation, and we may point out that on the BALCLUTHA a one-way-at-a-time bottleneck as bad or worse has been successfully negotiated by the public for five years. Not only is the ladder from the chart-house to the saloon on the BALCLUTHA so narrow that people must back up or down or wait for those coming in the opposite direction, but it is as steep as the WAPAMA's engine-room ladder would be. Oddly, this is one of the few ladders on the ship which does not have some accident or injury-claim history.

Recommended Access

We recommend that the existing ladder be modified as suggested in item #4 above.

If experience with the single steep ladder shows that it is either unnecessarily dangerous or so inconvenient as to sharply reduce potential traffic the alternative solutions can be reconsidered.

II

RESTORATION DETAILS

Notes from a Survey in
Company with Nils Ronberg,
Mate and Master of the
WAPAMA, 1922-1926.

RESTORATION DETAILS : From a survey in company with Nils Ronberg, mate and master of the WAPAMA, 1922-1926. April 6, 1959.

Wheel House

The house did not originally have the small vestibules to port and starboard; the old hinges for the bridge wings show the proper limits of the house.

There was no desk or chart table in the pilot house.

Steering gear was as it appears to be -- hand-powered gear.

Funnel-Casing

There was a 2 x 12 plank, painted green, laid along either side of the casing to serve as a bench for passengers to lounge upon.

Top of Boat Deck House

The ladder leading from the boat deck to the top of the forward end of the house was a late addition. [Note that early photographs show the railing around the top of the house stops about 10 feet abaft the forward end.]

On either side of the house top were park-type benches, painted green.

The standard compass was in the center of the house top, placed well aft.

Captain Ronberg questioned the antiquity of the two cowl ventilators piercing the house top; photographs show that there was only one.

The canvas on the house top was painted light gray.

The railing and the ladder leading to the boat deck aft are about as original.

Boat Deck

Lifeboats swung on old-fashioned davits, and the lifeboat falls were coiled down in tubs.

The running lights were mounted on brackets at the forward out-board ends of the boat deck proper -- just forward of the forward lifeboats.

The boat deck canvas was painted light gray.

There was a deck box on the boat deck at the stern rail.

Boat Deck House

The deck inside the house was not canvased.

The cabin arrangement was similar to the present one, except that all of the cabins but the master's were the same and ran only to the center-line bulkhead. Each cabin had two berths and a washbasin.

The bathroom projecting out from the after end of the house was a late addition.

Poop or Cabin Deck

The deck was scrubbed white. The alleyways leading forward from the poop were not canvased as at present.

The winch platform, and the ladder leading from the winch platform to the winch-driver's platform and pilot house was as at present.

Cabin Deck Accomodations

There were four toilets located at the after end of the house: one for officers and three for passengers. These were the only toilets for cabin passengers, and there were no baths or showers.

The two passenger cabins abaft the lounge were about as they are at present, except that the lower berth in each cabin was double. These were the largest of the passenger cabins.

The lounge or "social hall" was fitted with a settee around three sides -- upholstered in red plush.

Forward of the social hall was the smoking room, which opened onto the poop on either side. This room was the same size as the cabin which presently occupies this location. The smoking room was fitted with a bench along the forward bulkhead, a narrow table running athwartships, and two or three swivel chairs (similar to those in the dining saloon) opposite the bench.

The chief engineer's cabin had a desk; the ventilating shaft running through this room may not be original.

The wireless operator's cabin also housed the radio equipment. (See plan for location of these cabins.)

Main Deck

The main deck was treated with Stockholm tar.

The hatch appears to be the original size, to Captain Ronberg's recollection.

There were large king posts at the forward and after ends of the hatch.

Main Deck Cabins Forward of Engine Room

The cabin on the starboard side between the boiler uptake and the forward end of the superstructure housed the three firemen.

To port, there were two cabins, the forward one for the watchman and the after one for the two winch drivers.

Galley and Saloon

The arrangement of the galley, ice-box, and pantry was about as it is at present.

To port, where there are now storerooms, there was a small mess for the crew and steerage passengers. There was no doorway between the crew's messroom and the main saloon.

The dining saloon ran the full width of the ship. There were three tables, as there are now, and the benches were probably upholstered with red leather cushions. The captain sat at the after end of the starboard table, the other officers at the center table.

After Cabins

The steward's department occupied the two cabins in the very stern: steward to starboard and the cook, pantryman, and two waiters to port. The bulkhead between the cook's and waiters' cabin and the outboard port passenger cabin appears to have been moved from its original location.

There were four passenger cabins immediately abaft the saloon, roughly similar to those presently installed.

Forecastle

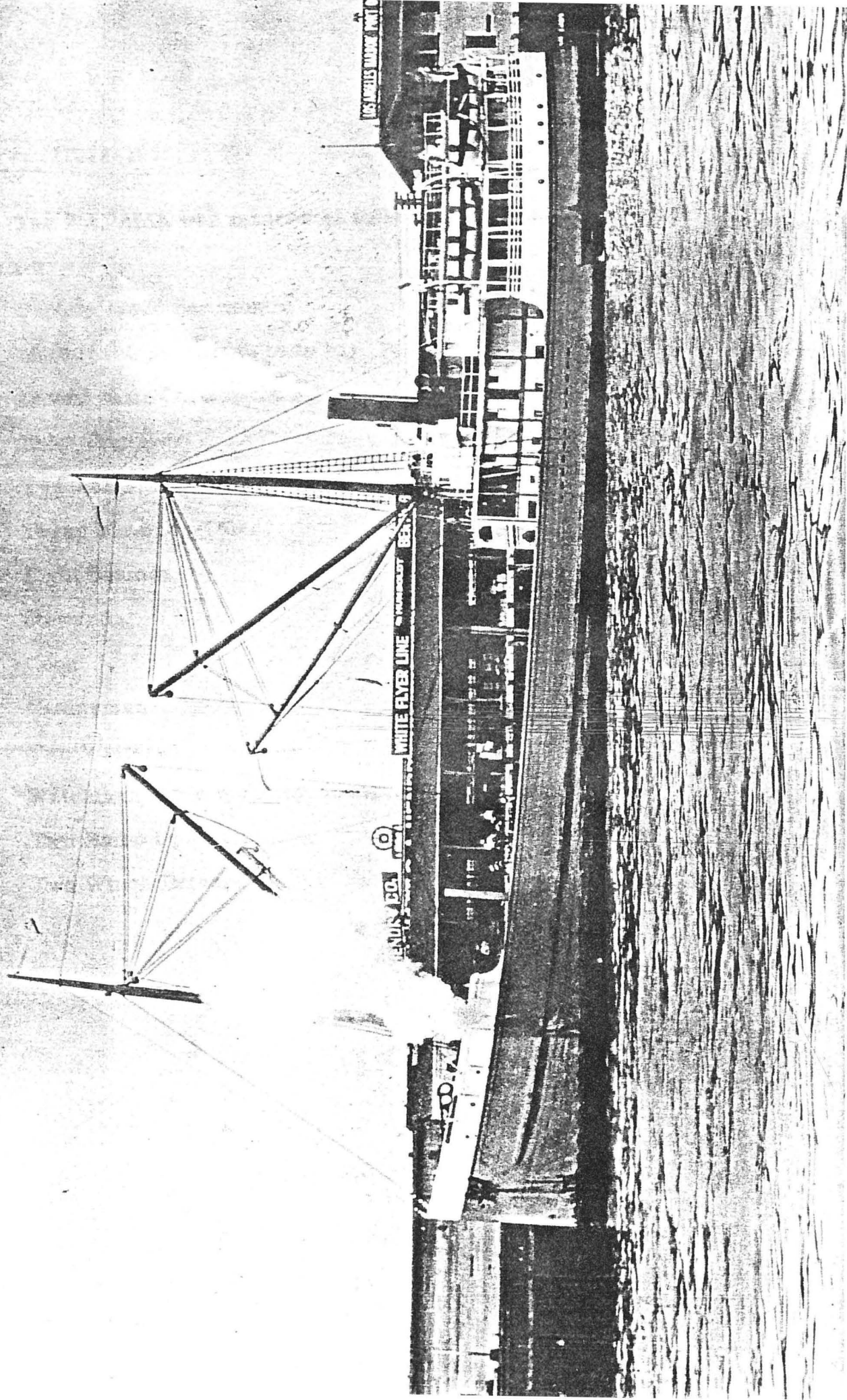
The forecastle was divided down the center line, with eight seamen occupying the port side, and steerage passengers the starboard side.

WAPAMA BEFORE ALTERATION

Alongside the White Flyer Line
Pier at San Pedro . . .

This photograph shows the WAPAMA sometime before the view following page 34, and probably represents the original appearance of the vessel.

Note the short, folding bridge wings, the sampson posts on the main deck, and the oiled ironbark stanchions supporting the boat deck in the way of the pilot house and funnel casing. The lifeboats are similar or identical to those with which the WAPAMA is presently equipped.



The Crew (1922-1926)

The WAPAMA was manned as follows when Captain Ronberg was in her:

Captain (\$300 per month)

Mate (\$150 per month base pay, but about \$250 with overtime)

Second Mate (At sea the mates stood 12 hours on and 12 off)

Chief Engineer

Two Assistant Engineers

Three Firemen-Oilers

Eight Seamen

Steward

Cook

Pantryman

Two Waiters

Watchman (This man kept lounge, saloon, etc., clean)

Two Radio Operators

Two Winch Drivers

III

DRYDOCKING AND BOTTOM WORK

Specifications, June, 1959

Work Done, July, 1959

The Next Drydocking

SPECIFICATIONS FOR DRYDOCKING AND UNDERWATER MAINTENANCE, STEAM SCHOONER WAPAMA, June, 1959

It is most desirable that the WAPAMA be drydocked and her hull scraped and painted no later than the first part of June, 1959, as by that time it will have been slightly more than nine months since her last drydocking, in Seattle.

The following work and services must be accomplished:

I. Services:

- A. Towing from present berth to drydock and return to Oakland Dock & Warehouse Company. This item should probably not be included in the request for bids, but if the successful bidder has the necessary tugs it will probably be most economical to arrange with him for the movement.
- B. Moorings -- Furnish labor and materials needed to moor, un-moor, drydock, and berth vessel and to handle necessary gangways.
- C. Fire Protection -- Connect fire system to shore lines, and provide other necessary fire protection.

II. Drydocking:

Set necessary blocking and dock vessel for accomplishment of maintenance and repairs to bottom; refloat vessel promptly upon completion of work.

Attached is drydocking information from the Puget Sound Bridge and Dredging Company, which drydocked the ship in September, 1958.

III. Cleaning and Painting:

- A. Furnish labor and materials to remove all marine growth below waterline; remove any loose paint and blisters; wash down with fresh water.
- B. Apply one spray-coat and one roller coat of International red copper bottom paint (or equivalent quality copper anti-fouling paint) from waterline to keel. Repaint draft markers.

IV. Extra work; bidder to furnish unit prices:

- A. Burning and cementing worm-holes.
- B. Cementing holes and gouges.
- C. Reefing, recaulking (four or more threads oakum), and paying of seams and butts.

It may also be desirable to renew one of the through-hull fittings for use as an intake for the fire and/or sanitary systems.

WORK ACCOMPLISHED AT WAPAMA DRYDOCKING, JULY, 1959

The following work was done when the WAPAMA was drydocked at the Moore Dry Dock Company in mid-July:

1. The bottom, after removal of all marine growth, slime, etc., was found to be in good condition, with little evidence of damage from marine borers. Worm holes, nicks, and gouges were burned to kill any teredos, and cemented. The bottom was painted with one spray-coat and one roller-coat of copper anti-fouling paint.
2. In addition to this anticipated work on the bottom, three sheets of copper, apparently installed as a ground, were removed; plywood covers over through-hull fittings were removed and sheet-lead covers installed after inspection of the fittings and the surrounding wood; a new copper plate was installed over the grounding-bolt to prevent possible leakage; deeply eroded areas in the rudder and rudder post were gouged out, cemented and covered with lead as necessary.
3. A sea-suction valve on the port side, aft, was overhauled and reinstalled, with a strainer, in order that it might be incorporated in the near future into the vessel's pumping system for fire-protection and wash-down of the docks.
4. The anchor windlass, which was too heavy for the Oakland Dock & Warehouse crane to lift, was removed from the forecastle to the main deck, in order that the rotten wind-

lass-bed and surrounding decking might be replaced in the future.

5. Four new zincs were installed on the iron skeg-plate. The existing zincs in this area were very badly wasted, while those above were in comparatively good condition. The rate at which the new plates erode should provide some indication of the potential electrolysis problem with the WAPAMA. The ship has bronze rudder hangings and stern bearing, which represent a potential hazard to the iron planking fastenings in the stern area, particularly if the electrical system aboard the vessel "leaks" any.
6. While the vessel was in the yard, Mr. Dring took the opportunity to have a bent mast-band put back in round in the shop.

FWD SIDE OF RUDDER POST

ON DOCK JULY 14, 1959
OFF DOCK JULY 17, 1959
DRAFT 8' 6" FWD, 16' 6" AFT.

54'

12'

12'

12'

12' 6"

12'

12'

PONTON N° 3 — PONTON N° 2

10' 0"

22 KEEL BLOCKS SPACED 4' 0" CTRS.

5' 6"

3' 0"

7 @

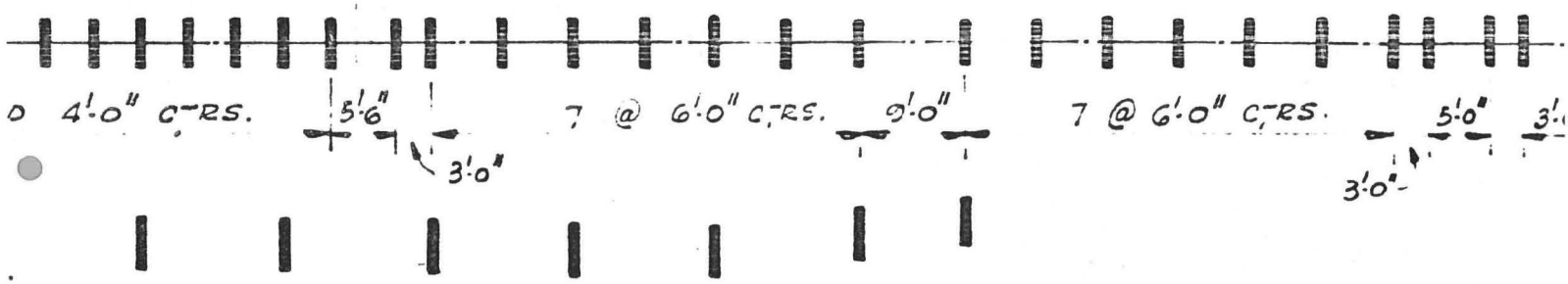
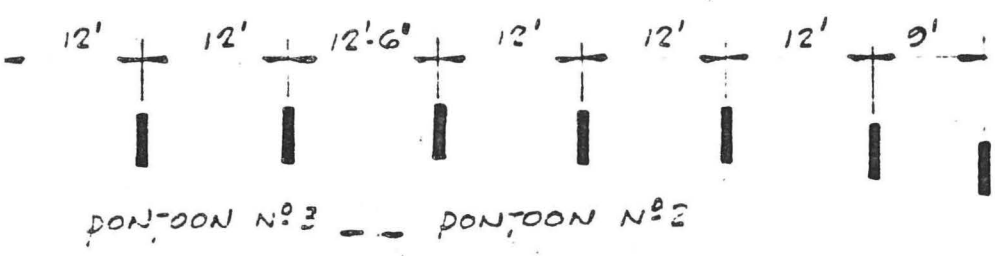
S.S. "WAPAMA"

POSITION OF VESSEL ON

SCALE 1/16" = 1 FT.

50
50
6" AFT.

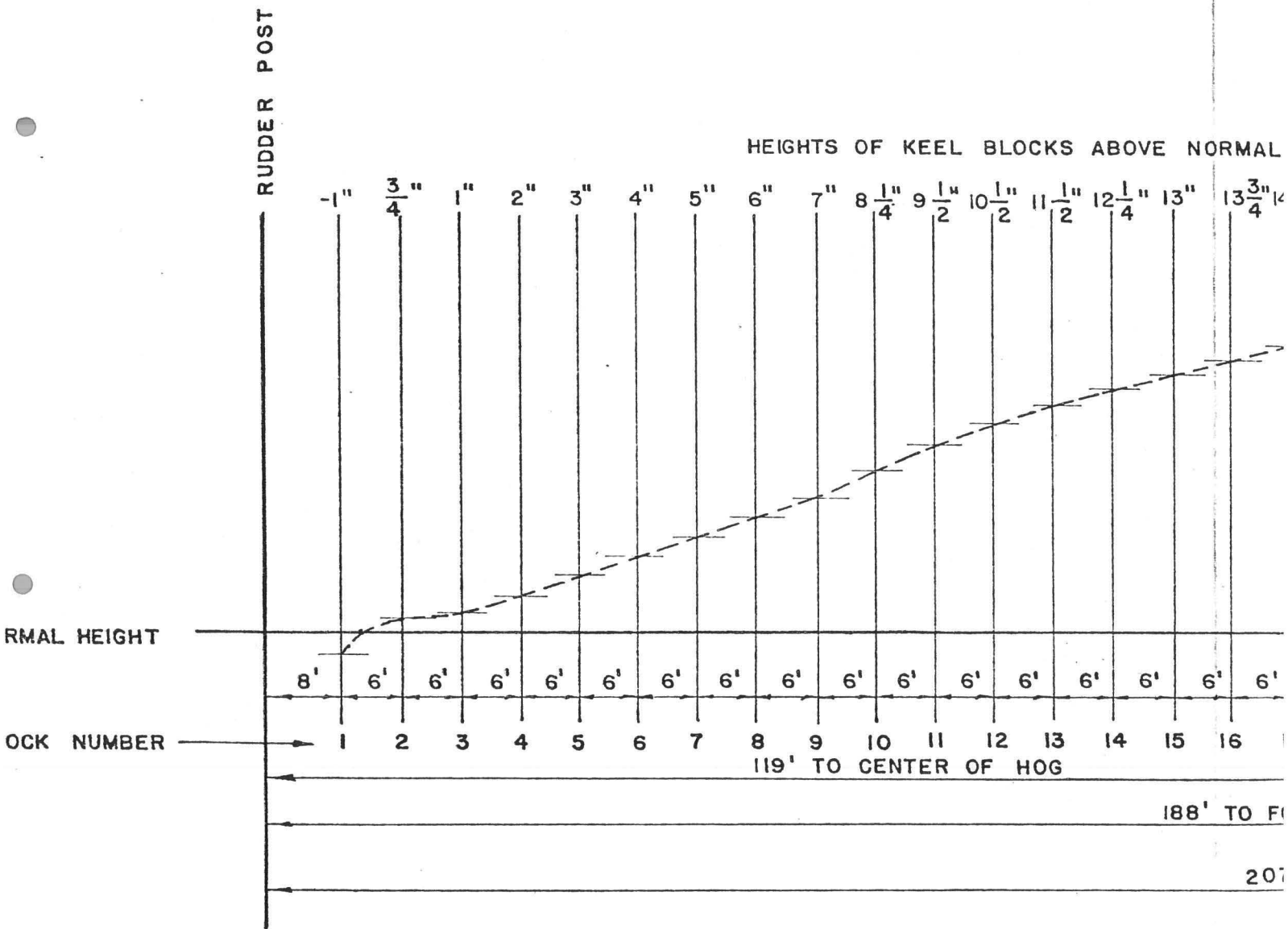
MOORE DRY DOCK COMPANY
OAKLAND, CALIFORNIA
HULL DESIGN DEPARTMENT



S.S. "WAPAMA"

POSITION OF VESSEL ON DOCK #5

SCALE 1/16" = 1 FT.



[illegible]

SAN FRANCISCO MARITIME MUSEUM	
KEEL PROFILE ST. SCH. WAPAM	
VERT. SCALE - $1\frac{1}{2}"$ EQUALS 1'	DRN. BY: S. JAXON
HORZ. SCALE - $\frac{1}{16}"$ EQUALS 1'	DATE: JAN 15, 1960

THE NEXT DRYDOCKING

Experience with the C. A. THAYER during the past two years would indicate that a one-year interval between drydockings is not too long. It is our recommendation, however, that no longer than one year be permitted to elapse between drydockings for routine bottom maintenance. The WAPAMA, then, should be drydocked no later than July, 1960.

Our inspection of the bottom in July, 1959, led to the following conclusions relevant to the 1960 docking:

1. The most deeply-scarred plank on the starboard side, (just below the turn of the bilge and about 60' from the bow) must be replaced for a length of about 30' in the comparatively near future -- though not necessarily at the next drydocking, if funds are not available.
2. The nib ends of the planking in the run, from the waterline down about ten feet, are covered with 1/4" copper plate on either side of the stern post. The planking beneath must be in poor condition, and at the next drydocking these plates should be removed for inspection, specification for repair drawn up, and the plates replaced in anticipation of repair at the following docking, unless the condition of the planking is such as to demand immediate attention. Against the chance that this may be the case, a very large contingency fund should be appended to the next drydocking contract.
3. Preparations should be made, in conjunction with the advice of the Machinery Specialist, to remove the shaft and plug the stern tube at the next drydocking.

A TROUBLE-SPOT

The WAPAMA's Stern will be
a Source of Future Expense

Maritime Museum Curator
Roger Olmsted points to the
most serious potential trouble-
spot in the WAPAMA's bottom.
The angle brackets on the rudder
post were apparently installed
to stiffen rotten planking;
the heavy copper patch over the
propellor-arch indicates trouble,
too.

IV

FUTURE OF THE OLD SHIPS
RESTORATION PROGRAM

Lessons of Experience

Personnel

Proposed Maintenance Staff

Comparison with BALCLUTHA

New Positions

Annual Cost of
Maintenance and Repair

State of the Program
on 30 June, 1960

1960-1961 Program

"Operational" and
Administrative Personnel

Conclusions

FUTURE OF THE OLD SHIPS PROGRAM: DECEMBER, 1959

Lessons of Experience

The gratifying success of the restoration project on the C. A. THAYER and WAPAMA during the last six months is presently enhanced by the certainty that the next six months will show even more positive results, and there is now little doubt but that any future analysis of the operation during the fiscal year 1959-1960 will reveal a near-model program for the economical restoration of old wooden ships. The fiscal year 1960-1961 will represent a year of transition for the project, as the current restoration funds are exhausted and the improvement and maintenance of the vessels comes to depend on a support budget and the services of a permanent staff.

The experience with the C. A. THAYER between October, 1957, and May, 1958, shows only too clearly that an unqualified staff is incapable of utilizing even an inadequate budget.

More recent experience has shown that even with the employment of maritime "professionals" in the supervisory and highly skilled branches of the work, reliance on a much too broadly-based labor pool has led to constant difficulty in maintaining a rational program in the general ship's work department -- scraping, painting, etc.

Thus, it is not only essential to plan for the transfer of at least a portion of the present staff to a permanent basis, with their salaries drawn

from support funds, but it is highly desirable to extend the unique "old ships" positions downward, to include all of the essential labor positions.

Further, it is none too soon to anticipate the required maintenance budget, for even now restoration funds are being expended on what more properly may be considered maintenance functions. Next fiscal year the proportion of effort going to maintenance will be much higher.

Finally, it is apparent that an overly doctrinaire approach to the distinction between restoration and maintenance can lead only to confusion; these ships are never going to be "finished," and the day will never be reached when it will be possible to relax and run a simple "maintenance" operation.

Personnel:

A factor may be very easily overlooked in drawing any distinction between the present force of "restoration" employees and a future core of "maintenance" men: the current program is operating with a rather small crew, and the number of skilled maritime employees necessary to maintain the vessels indefinitely is very closely comparable. There are at least four good reasons for this:

1. The present program will fall far short of complete restoration, and is designed only to present the ships to the public as an adequate display. The permanent crew must be adequate to carry work forward, and to keep up with the deterioration of portions of the vessels which are not now so bad as to require repair.

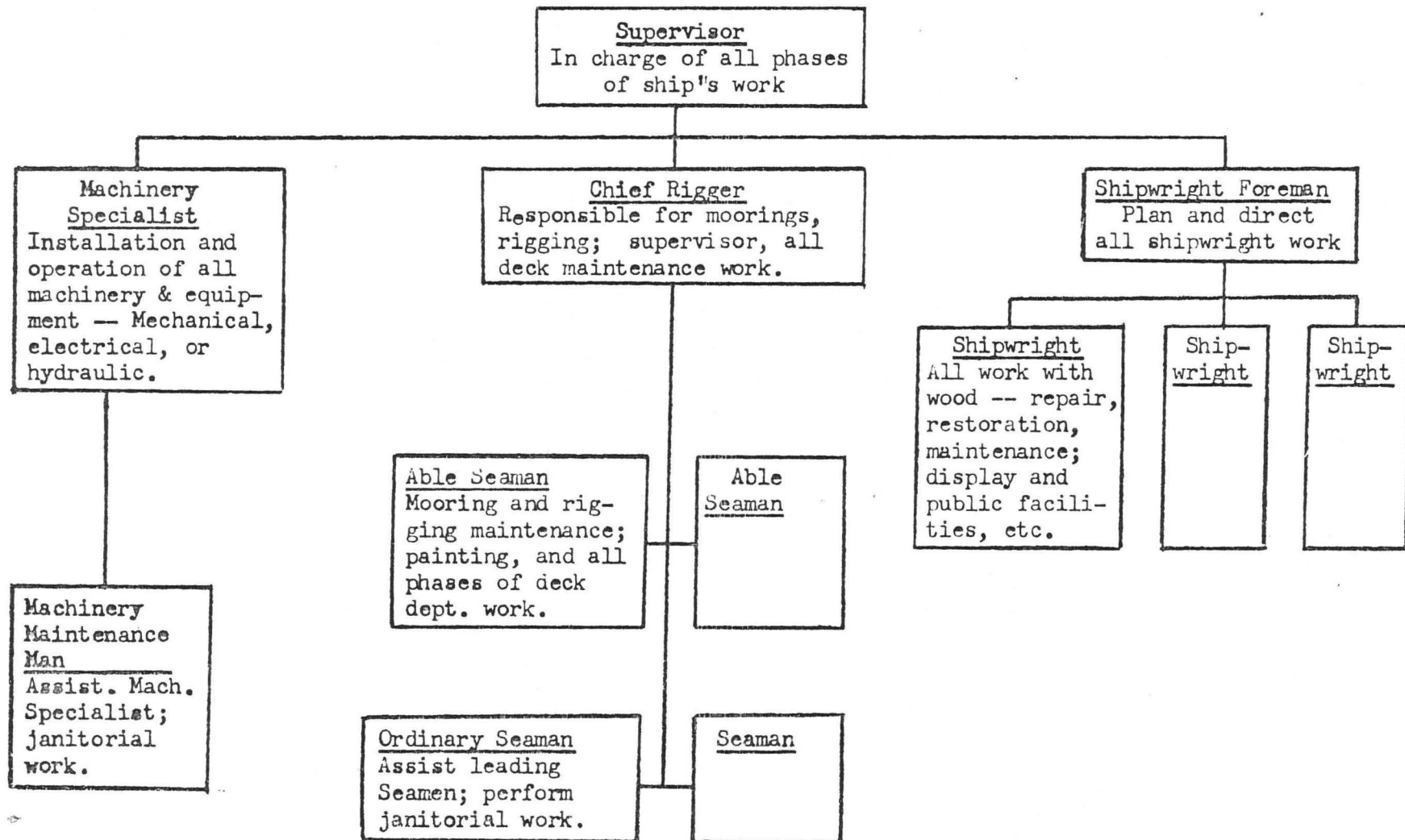
2. When the ships are moved to San Francisco, the mooring of the vessels, their safety, and provisions for the safety of the public will require an effort which is presently not required.
3. When the ships are placed on display they will have attained a vastly higher standard of appearance than would seem possible from viewing them in their present condition, and the effort needed to maintain this standard will add a new dimension to the work.
4. The presence of the public aboard the ships will tend to slow up work somewhat (and it is the proper duty of a seaman painting the hatch coaming to answer the questions visitors will badger him with), and on top of this the wear and tear on the ships (whether intentional or "normal") wrought by the public will be considerable.

If the maintenance and display phases of the Old Ships Program is to succeed, a small restoration program is going to have to turn into a big maintenance program.

Proposed Maintenance and Staff

Following is a chart showing the personnel necessary to the maintenance and repair staff. This staff is the same size as the present restoration staff; the shift to a more maintenance-oriented program permits dropping some shipwrights, but requires picking up three real seamen.

Permanent Maintenance and Repair Staff for
C. A. THAYER, WAPAMA, EUREKA, & ALMA



COMPARISON WITH BALCLUTHA

If the above staff seems large, it might be well to compare it with the maintenance staff of the BALCLUTHA, bearing in mind that the BALCLUTHA is a steel ship of about 1,500 tons, while the EUREKA, WAPAMA, C. A. THAYER, and ALMA are wooden ships measuring almost 4,000 tons in the aggregate. BALCLUTHA employs the following:

1. Manager: without a full time manager, familiar with all phases of ship maintenance, no rational program can be conducted, no matter how limited or extensive the budget may be.
2. Rigger: the rigger is an all-round seaman, whose particular charge is the maintenance of rigging and moorings.
3. Maintenance man: this man should spend his full time painting and doing allied maintenance work; his attention to janitorial duties means that extra help must be periodically procured to catch up.
4. Shipwright: the half-time shipwright, with about 1/6th time assistance from another shipwright cannot keep up with the work it would be desirable for him to do, even though the decks and joinerwork in the after cabin represent the only major masses of wood in the ship.

This staff, with some help from the Museum staff and from volunteers, is only adequate to prevent rapid deterioration, and only the occasional "boost" from additional volunteer, donated, or hired labor can pick up the slack.

The proposed minimum staff for the EUREKA, C. A. THAYER, WAPAMA, and ALMA was not determined by working out the crew-tonnage ratio between the two operations, but the mathematically inclined will find that it is coincidental. Presumably the larger crew will be somewhat more efficient in division of labor than the smaller, and the addition of Park Aide-type labor should relieve some of the more menial burdens from the Old Ships' crew: if this is not the case, then we must conclude that the staff here proposed may be too small.

The New Positions

It is proposed that the creation of four new classifications be considered. Two of these are highly skilled positions, the other two are designed to replace casual, unskilled labor of a high "turn-over" rate with somewhat more qualified and interested men who will have some career opportunity in the program.

The skilled jobs are in the "deck department" of the Old Ships operation. At the present time, there is only one seaman employed by the project -- Harry Dring, the Supervisor. The normal development of the program, or almost any foreseeable change in the location of the ships, will make it absolutely necessary to have some competent seamen employed.

1. Chief Rigger: This man would be in charge of the deck department, under the direction of the Supervisor, and thus would occupy a position comparable to that of the present Machinery Specialist or Shipwright Foreman in responsibility.

He will be responsible for the moorings (vital to the very safety of the ships), rigging, painting, and all other phases of maintenance and repair which do not come under the shipwright or machinery department: in short, almost all of the "routine" ship's work, plus the vital moorings. In this position, he would be in charge of the ships in the absence of the Supervisor.

This job calls for a man thoroughly schooled in the old-time sailorman's trade, which would mean the experience of at least a shipyard foreman rigger who has some sea time, or seaman who has extensive experience in sailing vessels.

2. Able Seaman: This job involves fulfilling the duties traditionally performed by an able seaman, and calls for a man who has achieved that rating from the Seaman's Union, is a journeyman shipyard rigger, or has some-similar qualification, such as employment aboard private sailing yachts.

The skills involved are not of the high level that is the case with the shipwrights, but are not, on the other hand, abilities acquired through some brief training. This position is needed in order to give some "depth" to the maintenance staff, for these men should be able to not only work without supervision, but should be able to supervise less skilled workers; the A. B. should be of such competence that he can accept the responsibility

for the safety and maintenance of a ship placed in his sole charge for some period of time (as, for example, if one ship is placed on exhibition for a time at some location away from the rest of the fleet.)

3. Ordinary Seaman: This is an "apprentice" rating, but should require enough background to place the job a cut above the ordinary highway-department laborers now employed aboard the ships.

The Ordinary Seaman should have had a year's sea experience in that capacity, or a year's experience as an apprentice rigger. He would perform all of the tasks within the province of the deck department; chipping, scraping, painting, tarring rigging, maintaining moorings, etc., and would also be available to assist as laborers in any other capacity required.

4. Machinery Maintenance Man: The duties of this position would include servicing operating machinery and maintaining the standard of display machinery, and of assisting the Machinery Specialist as needed in installing or repairing any kind of mechanical or electrical equipment.

Experience qualifications should consist of one year in the engine room of a merchant ship, or a year's experience as apprentice pipefitter in a shipyard. The job is comparable to that of Ordinary Seaman, as neither require any highly-developed skills, and the possibility might well be considered of including a test of simple mechanical abilities in the examination for Ordinary Seaman and the hiring of an additional Ordinary instead of setting up a separate labor class.

ANNUAL COST OF MAINTENANCE AND REPAIR

It would appear that about \$176,000 will be expended during this fiscal year (1959-1960) on the ships, exclusive of whatever support funds are available and the salaries of Rangers and Park Aides. This is a modest program.

About \$100,000 per year will be needed (exclusive of Ranger, Park Attendant, Park Aide, watchman, and ticket-taker salaries) to maintain these ships adequately after they are placed on display.

The following estimate is based on the salaries current employees would earn next fiscal year, and what it will probably be necessary to pay new employees during their first year; it does not include major capital outlay for generally non-recurrent expenses:

Salaries and Wages:

Supervisor	\$ 7,356	
Chief Rigger	6,360	
Shipwright Foreman	6,672	
Machinery Specialist	6,360	
3 Shipwrights at \$6,060	18,180	
2 Able Seamen at \$4,990	9,984	
2 Ordinary Seamen at \$4,296	8,592	
1 Machinery Maintenance Man	4,296	
	<hr/>	
	\$ 67,800	\$ 67,800

Drydocking & Bottom Maintenance:

WAPAMA	\$ 5,000	
C. A. THAYER	4,000	
ALMA	700	
	<hr/>	
	\$ 9,700	\$ 9,700

Supplies and Materials:	\$ 20,000	<hr/> 20,000
		\$ 97,500

State of the Program as of 30 June 1960:

We anticipate that with the current work force available, and with expenditures continuing at about the same rate as during the last six months, that the ships will be in the following condition at the end of this fiscal year:

1. C. A. THAYER. The THAYER will be ready for display to the public, with the minimum restoration complete, the vessel completely painted and in condition to make a favorable impression on the visitor, with necessary ladders and railings installed and the minimum necessary interpretive displays installed.

2. WAPAMA: The steam schooner will be far short of complete, for it is anticipated that the completion of the THAYER, and the reconstruction of the WAPAMA's fore-castle-head, boat deck house, saloon and lounge, and the installation of access ladders to the hold and engine room are large enough jobs to absorb the entire worktime of a six-man shipwright gang for half a year.

This opinion is based on an analysis of the pace of reconstruction projects undertaken during the last year, and as a result, includes all of the time "lost" on minor tasks which estimates would not reveal, the tendency of repair jobs on old ships to turn out larger than anticipated, and any other factors which cause the job to "grow".

The WAPAMA, then, will be approaching the condition the THAYER is in now -- but she is twice as big and the "mopping-up" after the major projects are completed will be at least twice as time-consuming.

3. EUREKA: The ferryboat maintenance program will go ahead, but the ship herself will continue to slowly deteriorate until the restoration of the WAPAMA reaches a point where some of the shipwrights and laborers can be shifted to her permanently.
4. ALMA: The ALMA can be painted, and should thus appear more presentable by June, 1960, but no restoration can be seriously attempted.

With the vessels in this stage of "completion" the balance of the restoration fund will be reaching a critical stage. As nearly as we can determine, about \$100,000 will remain of the \$276,000 fund on which the project is currently operating.

Unexpended balance 16 October 1959		\$ 126,435.73
Purchase orders, 16 Oct-16 Dec. (approx.)	\$ 2,600	
Between 16 Dec. 59 and 30 June 60, the following expenditures may be anticipated:		
Supplies & Materials	10,000	
Running Rigging & new moorings for THAYER	3,000	
Berth rental for THAYER & WAPAMA*	2,600	
Electical wiring contract for THAYER	2,500	
Contract & emergency labor for stepping WAPAMA masts & rigging booms	5,000	
ALMA drydocking	700	
	\$ 26,400	26,400
Unexpended balance 30 June 1960		\$ 100,035.73

*
This figure represents the amount that the contracts with Oakland Dock & Warehouse will cost from the signing of the new agreements through June 30, 1960.

1960-1961 Program

It appears that there should be enough left of the restoration fund to run a first-class maintenance program, and that additional funds must be forthcoming if there is to be really significant progress.

We may say with some confidence that if the 1960-1961 support budget amounts to \$70,000 or more (exclusive of Ranger, Park Aide, watchman, ticket-taker, etc., salaries and wages), the next year will be as successful as this year, and will see the WAPAMA ready for display and the EUREKA and ALMA positively and obviously improved. (Or the ALMA might be finished up at comparatively slight expense to the EUREKA.)

Starting from the cost of a basic maintenance program (see above for detailed breakdown), it is not difficult to make a sound guess as to what is needed above this to carry heavy restoration work forward. With regard to the salaries and wages cost of the maintenance staff, it should be noted that no significant budgetary economy can be realized by substituting laborers of the type now employed for the seamen.

Basic maintenance and repair program	\$ 27,500
EUREKA drydocking & bottom maintenance*	\$ 20,000
Electric wiring contract for WAPAMA	3,000
Boarding ladders for Hyde St. Pier location, and other expenses of accomodating the public and displaying the ships:	
C. A. THAYER	4,000
WAPAMA	3,000
Mooring system at Hyde St. Pier for C. A. THAYER & WAPAMA	5,000

Additional restoration workers:		
3 shipwrights at \$3,060	18,180	
3 laborers at \$4,092	12,276	
Specialist or emergency workers	4,000	
Additional restoration supplies and materials		
	5,000	
	<hr/>	
	\$ 77,456	
Cost of additional restoration effort		\$ 77,456
Total cost of adequate 1960-1961 program		\$ 174,956

The above figures are, of course, not designed to show that restoration should be paid for out of the support budget, but rather to give some idea of the extent to which the 1960-1961 support budget must relieve the restoration fund if restoration is not to slow down to a snail's pace sometime around December, 1960. All of the drydocking costs, a large portion of the supply and material expenses, and a good half of the desired staff could with perfect justice be charged to "support" next year -- which would total more than the needed \$70,000.

*EUREKA

The EUREKA presents a perfect example of the geometrical progression of deterioration in old ships, and delay in beginning major restoration repair will prove costly to an extent that seems out of proportion to the time lag involved. The interests of economy alone dictate the desirability of a greatly expanded restoration and maintenance program aboard this ship in the next fiscal year, and the interests of policy must certainly reinforce the achievement of an early display date.

The EUREKA's bottom is sheathed with yellow-metal, which obviates the need of costly annual drydockings. However, the plates are thin, and subject to damage by floating objects, and they may work loose

far below the waterline through various causes. For this reason, the EUREKA should be drydocked every five years for inspection of the bottom and repair or replacement of yellow-metal plates as necessary. The EUREKA came out of drydock with a newly-sheathed bottom in 1953; she should most certainly be drydocked next year. Worm damage develops in a more rapid progression than rot, and if marine borers have found entrance to the EUREKA's planking, delay could prove to be immensely costly.

Since it will not be necessary to return the EUREKA to the drydock for a number of years, it is essential that adequate funds be available when she is docked to do all the work which might be necessary.

1961-1962 Costs

We have been requested to furnish estimates of major capital outlay expenses which will be necessary or desirable for each of the ships during the 1961-62 fiscal year. Since what will be needed in 1961-62 depends in part on what is accomplished in 1960-61, and since we do not know how much money will be available during 1960-61, it is difficult to make any entirely satisfactory estimates.

The estimate following is based upon the assumption that the C. A. THAYER and WAPAMA will be in basic display condition by then, but that very little work will have been done on the EUREKA or ALMA. It is also based on the assumption that the maintenance and repair staff is at least as large as recommended above.

1961-62 Major Capital Outlay - C. A. THAYER

1. Annual drydocking and bottom maintenance. \$ 5,000

Experience over the past two years has shown that about \$5,000 should be available when the THAYER is placed on dock to allow for extra work that may be required. Actual cost of minimum annual bottom maintenance (drydocking, cleaning, and painting) about \$3,000.

1961-62 should include complete keel shoe removal. This work is absolutely necessary if vast future expenses are to be avoided -- which would be the case if the keel itself suffered severe worm damage.

2. Rebuild stem. \$ 10,000

The stem of the THAYER is presently held together by highly unsightly steel plates. The stem itself is very punk, and the hood ends of the planking are in poor shape where they are observable (they are without doubt much worse underneath the steel plates). Not only the appearance, but the very safety of the vessel is involved in doing this work.

3. Rebuild deck house to original dimensions, and restore interior to original layout. (Including opening fore hatch to original size.) \$ 2,000

The character and historical authenticity of the THAYER will be greatly enhanced by this work. The present house is a slap-dash makeshift dating from 1946, and the original (forward) portion of it is seriously rotted.

4. Install new donkey boiler in new deckhouse; install used donkey engine. Connect donkey engine to windlass, used steam pump. \$ 6,000

It is highly desirable from the standpoint of the ship's safety that power be available to the windlass, winch, and pump. The re-installation of steam equipment similar to the original will not only serve this end, but will be the last major step in returning the vessel to historically accurate condition. The installation of the donkey is interconnected with the restoration of the deckhouse.

5. Install deadeyes and lanyards in place of present rigging screws. 4,000

A finishing touch which will add greatly to the character of the ship.

\$ 34,000

1961-62 Major Capital Outlay - WAPAMA

1. Annual drydocking and bottom maintenance \$ 5,000

 2. Repair stern. \$ 12,000
 The extent of deterioration in the stern in the waterline area is not precisely known, but is very extensive. The construction is complex -- and once the job is commenced it must be finished.

 3. Put donkey boiler in working order; replace or overhaul steam lines to windlass and after capstan. Overhaul dynamo and one pump and install or overhaul steam lines. \$ 5,000
 (See item #4 C. A. THAYER).

 4. Install machinery to turn over main engine. \$ 2,000
 This installation will greatly enhance the display value of the engine room.

 5. Rebuild funnel trunk coaming, surrounding deck, and pilot-house -- continuing reconstruction of supporting structure as far as necessary. \$ 12,000
 The largest expense in this reconstruction will probably be in the repair of the structure underneath the pilot house and funnel coaming. This reconstruction should be accomplished as soon as possible, for so long as the upper structures are not watertight the lower structure will continue to deteriorate.

 6. Repair wooden lifeboats. \$ 3,000
 These lifeboats are an essential portion of the ship as a "finished" display.
- \$ 39,000

1961-62 Major Outlay - EUREKA

1. Drydocking, repair, replacement, or refastening of yellow-metal sheathing. \$ 17,000
 The EUREKA, BECAUSE OF HER SHEATHING, need not be drydocked each year. (Every five years should be adequate). However, for this very reason, it is essential that adequate money be available when she is docked to accomplish all necessary work.
 2. Repair lower portion of paddle wheels. \$ 3,000
 It is essential that the worm-eaten portion of the paddle wheels be repaired and the wheels be freed up so that they may be rotated for maintenance purposes while the ship is afloat.
 3. Repair broken crank pin. \$ 2,000
 The repair of this pin is necessary to the rotation of the paddle wheels and the eventual installation of machinery to operate the engine slowly.
 4. Renew all mooring lines. \$ 2,000
 5. Re-canvas all decks. \$ 3,000
 6. Repair rotten exterior and interior sheathing of superstructure as needed; repair seats and other furnishings to display standards. \$ 18,000
 7. Display. 5,000
 The EUREKA is a very large and very empty ship, and calls for much more in the way of display and interpretive material than the THAYER and WAPAMA.
-
- \$ 50,000

1961-62 Major Capital Outlay - ALMA

1. Annual drydocking & Bottom maintenance	\$ 1,000
2. Purchase, step, and rig masts, booms, and bowsprit.	\$ 5,000
3. Reconstruct cabin.	\$ 3,000
4. Repair bulwarks, deck, coamings, and planking as necessary.	\$ 5,000
5. Display.	\$ 500
	<hr/>
	\$ 14,500

"OPERATIONAL" AND ADMINISTRATIVE PERSONNEL, 1960 - - -

We cannot presume to estimate the staff requirements in the conventional Park ratings, (Rangers, Park Attendants, Park Aides) as the nature of the program will change rapidly in this respect from the moment the first ship is placed on display onwards. The administrative position of the project within the division is not properly our concern, but will affect personnel requirements; the number of visitors, and the hours the ships remain open will have considerable influence, as will the relationship of the ship operation to the larger historical monument operation.

To some extent, however, the duties of the "operational" and the "maintenance" staff tend to overlap: for example, to what extent will maintenance personnel be expected to perform routine janitorial duties? To what extent will Park Aide labor be available for unskilled maintenance work?

It would appear that provision should be made for enough Park Aide labor to relieve the maintenance staff of the most routine "clean-up" work, particularly during the busier half of the year. Provision must also be made for an adequate number of ticket-takers and time-clock equipped night-watchmen.